American Gas Association MONTHLY

Gas Technicians and Defense

•

Industrial Management Terms

•

CP—Your Insurance Policy

•

Ohio's Natural Gas Storage

•

Hot Water from Central Units

May 1941

VOLUME XXIII NUMBER 5

"IT MAKES YOUR COOKING SIMPLER THAN EVER BEFORE!"

"YOU'VE NEVER SEEN SUCH AN OVEN FOR BAKING RESULTS!"

"AND ITS SUPER-INSULATION KEEPS KITCHENS COOLER!"

"JUST THINK—YOU DO MORE COOKING WITHOUT ADDED FUEL!"

Why 3 out of 4* women now choose GAS for modern Automatic Cooking

* This ratio is approximate for the country as a whole. It is actually much higher in communities where gas utility service is available. It applies to all ranges using automatically delivered fuel.

Why are modern Gas ranges so popular?

Because they make cooking so easy and economical and because they add so much to the appearance of your kitchen!

Look at *just a few* of the amazing things you can do with one of these modern miracle-workers!

- Grill steaks and chops to a new deliciousness on a new type Quick-Searing "smokeless" Broiler.
- Bring liquids to a boil *faster* than ever before on a new Giant Top Burner that gives ⅓ more heat.
- Bake in a new Precision Oven that holds any temperature you wish from 250° to 500°.

In addition to the many exclusive advantages of modern Gas ranges, you get the added benefit of a fuel *unsurpassed* for cooking! Nothing else offers the *instant heat*, the *flexibility*, and *dependability* of Gas.

This amazing advance in cooking ease, results and economy is brought to you by the American gas industry which, through its laboratories and other agencies, is constantly improving its service to you.

Do stop in at your local Gas Company or Gas Appliance Dealer's and see the new Gas ranges.

GAS

THE WONDER FUEL FOR COOKING

CP

If you want the most for your money in a Modern Gas Range, see the new Certified Performance models. Whatever make you buy, the CP Seal assures your getting all the 22 super-performance standards established by the Gas Industry.

AMERICAN GAS ASSOCIATION

LET GAS DO THE 4 BIG JOBS—COOKING • WATER HEATING • REFRIGERATION • HOUSE HEATING

American Gas Association MONTHLY

CONTENTS FOR MAY 1941

With the nation edging towards war, the gas industry is mobilizing its resources for any emergency. President Strickler in a forthright address before the distribution engineers, printed in this issue, tells why gas is one of the first essentials to mechanized national defense. Other engineers at the same conference spotlighted peacetime operating problems as well as extraordinary subjects related to the national emergency. . . . With a straight-from-the-shoulder wallop, Mr. Cohn sets the industrial department back on its heels for not taking the initiative more often in securing management's support of its activities. It's "must" reading for the industrial engineer. . . . Fall River has gained its second wind on the CP program so that's why Vinton Potter calls CP "your insurance policy." . . . Mr. Cottingham presents a timely outline of the Ohio method of underground storage—which rounds out the excellent symposium presented at the last natural gas convention. . . . Ray Conner outlines the far-reaching research program at the A. G. A. Laboratories. . . . A new development, the tankless water heater, installed in a central heating gas-fired boiler is described in this issue by P. B. R. Baas. It has potent possibilities.

PAGE

163 Machine Age—Gas Technicians' Part in National Defense.....THOMAS J. STRICKLER
165 Today's Challenge—The Industrial Department's Responsibility to Management.....CHARLES M. COHN
167 CP—It's Your Insurance Policy.....H. VINTON POTTER
168 Ancient Chinese Drilled Deep Natural Gas Wells by Primitive Methods.....C. M. YOUNG
169 Underground Storage—An Outline of the Ohio Fuel Gas Company Method....KENNETH C. COTTINGHAM
172 Gas Research Expands Frontiers—Reaching New Heights of Achievement.....R. M. CONNER
175 Gas Industry Gains as Reflected in Annual Reports for 1940
176 Music Hath Charms—An Old Saying with a New Meaning
178 Personal and Otherwise
180 Convention Calendar
181 Affiliated Association Activities
183 Joint A. G. A.-E. E. I. Conference in Cincinnati Makes Notable Accounting Contributions.....W. G. MURFIT
186 The Development of Summer-Winter Hot Water from Central Heating Gas-Fired Boilers.....P. B. R. BAAS
190 A Word to Industrial Gas Men from the Rate Committee.....CLINTON LEE FOLLMER
191 Air Conditioning Research Launched at A. G. A. Testing Laboratories
192 Going Ahead with Industrial Gas
193 Preparedness Is Keynote of Distribution Conference.....HAROLD L. GAIDRY
196 First Motor Vehicles Conference Cites Advance in Modern Transportation Methods
197 Production and Chemical Men to Review National Problems at Annual Conference

SUBSCRIPTION · $3.00 A YEAR

Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which will be a bi-monthly issue. Editorial Offices, 420 Lexington Avenue, New York, N. Y. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Cable Addresses: American Gas Association
AMERIGAS, NEW YORK
American Gas Association Testing Laboratories
AMERGASLAB, CLEVELAND

THE ETERNAL FLAME—A prize-winning photograph by H. W. Nicholson, distribuiton engineer of the Public Service Electric and Gas Co., taken at the Harrison Gas Works in New Jersey. Photographed while a water gas set was being cleaned, it shows the same fire, transplanted from the old Market Street Works, which has been burning continuously since the middle of the last century.

American Gas Association MONTHLY

JAMES M. BEALL, *Editor*

MACHINE AGE
. . Gas Technicians' Part in National Defense

By THOMAS J. STRICKLER

President, American Gas Association

ONE of the most timely and important problems facing us today is the important part the gas industry will play in national defense in terms of armies, navies, guns, tanks, ammunition and airships. They naturally are the mobile ramparts upon which we rely to repel attacks from without, and to safe-guard our physical security. The appalling destruction now being wrought in many parts of the world by contending armies and fleets has brought home only too vividly the realization that war is fought with machines—machines which have changed completely methods of attack and, accordingly, methods of defense.

In past wars we relied for our safety upon the valor of our fighting men. The nations having the greatest number of trained men won the wars because the equipment of war, other than ammunition, was secondary. Naturally, when the defense of our country depended primarily upon trained man power, the gas industry played a minor part in the preparation of national defense.

•

Today the picture has changed completely because war is fought with machines and gas is used to make those machines. Individual bravery is no match for planes and tanks and automatic machine guns. With machines at his command one man may sink a battleship or blow up an ammunition depot. Mechanized defense is the only protection against mechanized attack. To build up this mechanized defense then, we must have first the necessary plants to make the machines and the tools with which to make them. These are not tools in the ordinary sense, but precision machines, some of them weighing many tons which operate with incredible speed and accuracy in shaping the parts which go to make the tanks and engines and other weapons of modern warfare.

It is apparent, therefore, that gas as a fuel to operate these machine tools is one of the first essentials of national defense. It is the driving force put to work turning out mechanical equipment needed to maintain our army and navy. We, of the gas industry, must not only plan our operations to meet the requirements of industrial plants which produce war machines, but also fulfill our obligation to our peacetime industries and domestic customers.

•

I do not share with those who are of the opinion that our security is in immediate danger of attack from without. I believe that the greatest danger lies from an attack from within. We, in American industry, should profit by what we have seen happen to others during the past year. To be effective, national defense must be complete defense. It must hold at bay not only enemies outside the walls, but also the enemies who assail it from within. We must be vigilant to resist one form of attack as well as the other.

In some respects the danger from within is the greater of the two. Those who wage it wear no uniforms. They hide their evil designs behind innocent occupations. They parade their destructive purposes in the clothing of democracy. They try to impair our physical strength by sowing seeds of moral discord. They invoke the protection of the very government they attempt to overthrow.

As I have said before, I do not join with those who expect an attack from without in the very near future, but it would be folly for us to cover our eyes to what is happening elsewhere throughout the world, and merely say, "It Can't Happen Here." Let us be far-sighted and not be caught napping. We should make every preparation pos-

Extracts from address before A. G. A. Distribution Conference, Pittsburgh, Pa., April 21, 1941.

sible for the protection of our plants and properties should an outside attack occur. Already a number of companies are working on plans that can be put into immediate effect should such an emergency arise. To some of you this may seem like a case of "Wolf, Wolf," but if you will stop and analyze what has taken place throughout the world you will realize that the time we spend now in such preparation may prove to be our most valuable asset at a later date.

We who are familiar with distribution problems in the United States have felt at times that our lot was indeed a difficult one. Supplies of gas sometimes diminish, floods occasionally raise havoc with our distribution systems. Major or minor mishaps are apt to strike almost any time. Yes, we have had some difficult problems to deal with during the past decade, but stop and think for one moment what the distribution executives in England have had to deal with during the past eight months. Theirs has been a second Dunkirk. How these men have carried on under such devastating destruction and continue to deliver gas service is a miracle that should, and probably will be, recorded in history. They were not prepared to deliver service under such destruction. They have had to work out solutions as they went along. They certainly have our heartfelt admiration for the courage and initiative they have displayed during these trying months.

The American gas industry is well ahead in its defense plans and preparations. A number of gas companies have been obliged to construct new mains and transmission lines to meet the requirements of industries who are manufacturing vital war materials. All of this work is progressing with dispatch to accommodate large scale government contracts. In no case have contracts been delayed by the inability of the gas industry to do their share. This close cooperation will continue to the utmost of our ability.

During these abnormal times it is necessary for us to not only concentrate our efforts on the supply of fuel for war industries, but also we must be ever mindful of our obligation to our peacetime customers. We must continue to be on the alert for ways and means to improve our service to those whom we have had the privilege of serving throughout the years. According to the past history of the gas industry, some of its most important progressive strides have been made during times of stress.

It is becoming more difficult each day to secure many of the materials and equipment that we need in the operation of our business. We have heard much of priority and we will continue to hear more about it in the months ahead. It is my advice to place orders for vital materials as far ahead as humanly possible. In doing this we not only help ourselves, but help others as well. Ours is a vital industry, but others will receive priority over us unless we foresee our requirements well in advance.

In view of the difficulties which are bound to arise in the securing of materials, it is up to this group to use their initiative as never before in working out substitute materials and equipment. Aluminum, copper, tin, steel, and many other vital materials will become increasingly hard to secure. We can't wait until they can be secured, so it will be up to you gentlemen to work out substitutes to carry us through this emergency. Some may be costlier, some may be cheaper, but the gas service must continue to flow. Already the program committee for the Spring Conference is considering discussions on what to do when the supply of coal and oil grows scarce, regarded as a certainty. Further thought will be given on how to meet mounting costs of labor, pipe, and all other materials. These are facts which we must face, and have the answers ready when the time arrives.

Through the initiative of you men assembled here will come many startling discoveries during the coming months. I predict that not one gas company will close down because of inability to secure some needed material. You will find a way to do the job in another manner, and in many cases it will be superior to the way it is being done at the present time. In these abnormal times, permanent progress will be made and further contributions given to the efficiency of operating systems.

New Use for Helium

THE Bureau of Mines, in cooperation with the St. Francis Hospital of Pittsburgh and the University of Pittsburgh, has developed a technique of using helium that permits the use of non-explosive gas mixtures containing combustibles for anesthesia. The details of this work were discussed by one of the bureau's chemists, George W. Jones in a lecture on March 25 at the University of Maryland.

Natural Gas Convention Convenes May 5 in Dallas

AS this issue of the MONTHLY comes off the press, the natural gas men's big event of the year is about to begin. The thirty-sixth annual natural gas convention convenes for a three-day session May 5 to 7 at the Adolphus and Baker Hotels, Dallas, Texas. Steeped in tradition and renowned for splendid constructive and inspirational gatherings, this year's program follows precedent and is packed with informative papers and five-star features of great interest to all classes of the industry.

In addition to General Sessions under the leadership of H. D. Hancock, chairman of the A. G. A. Natural Gas Section, and president of Gas Advisers, Inc., New York, there are separate sessions on Transmission, Production, Residential Gas Sales, Industrial and Commercial Gas Sales, and Accident Prevention. With the hospitable Dallas as host city, ample entertainment functions, and a South-of-the Border tour arranged, all signs point to a convention unmatched in the long history of this event.

Advance registrations assure a record attendance. If you haven't registered, it's not too late to toss an extra shirt in your suitcase and join the crowd. All roads lead to Dallas!

Today's Challenge . . . *The Industrial Department's Responsibility to Management*

Charles M. Cohn

By CHARLES M. COHN

Executive Vice-President, Consolidated Gas Electric Light and Power Co. of Baltimore, Baltimore, Maryland

DURING the past ten years or so, the gas industry has been confronted with a somewhat critical situation brought about in large measure by competition. This competition is coming chiefly from fuel oil, which has been selling for some years at very low prices. This has made it necessary for the gas industry earnestly to strive not only to retain the domestic markets it has long enjoyed but to develop new markets as well, and in this effort the industrial departments of the gas companies must play a major role.

Highly Specialized Field

Now, it is clearly recognized that the promotion of industrial gas business is not the same sort of proposition as the promotion of domestic uses. The domestic business consists in the supplying of a uniform service to a mass market of a relatively dense nature. When the gas utility enters the industrial field, however, it is confronted immediately with highly specialized situations ranging over many different types of industry having widely varying fuel and heating requirements. Obviously, the promotional methods, rates and service policies used in securing domestic business will not apply in the industrial field.

How are we to take full advantage of the undoubted opportunities awaiting us in the industrial field? This is one of the big questions that face the Management of any gas utility today. It is a question, I venture to say, that cannot be satisfactorily answered unless the industrial department carries out its responsibilities to Management.

These responsibilities might be grouped under *three headings*—(1) *market surveys,* (2) *rates and terms of service,* and (3) *promotional methods.* Let me speak very briefly about each of the three, just to make their meaning plain.

The first responsibility of the industrial department is to acquaint the Management, in a clear and forceful manner, with the possibilities for profitable enterprise in the industrial field. That is what is meant by the term "market surveys"—locating, studying and appraising the particular industries in which the possibilities lie. This calls for insight, experience, technical ability, and a thorough understanding of industrial operations and processes and of the competitive position of gas. It also requires *high enthusiasm* for the qualities of gas and its advantages over other fuels.

Personal Initiative Important

The initiative in surveying the market should come from the industrial department. It cannot, as a practical matter, come from Management itself. If presented with conclusive analytical reports and recommendations, *prepared in a clear and forceful manner* by the industrial department, Management may usually be expected to approve the recommendations and to authorize the man power, the expenditures, etc., necessary to carry them out.

The market survey constitutes the *master plan* on which the structure and the activities of the industrial department may intelligently be based. Without such a plan, Management will no doubt be unwilling to go very far in pursuing an uncharted course.

Nor is the market survey just a one time proposition, something to be done only when an industrial department is being newly established. Conditions of the market, and of competition for the market, are constantly changing, so that the surveying of these conditions must go forward continuously.

The second responsibility of the industrial department is to work for the establishment of rates and terms of service that are fitted to the needs. Perhaps it may surprise you to hear this responsibility placed at your door, for most utilities have special rate-making departments. But bear in mind that the rate-making department, while quite expert in its line, is not in intimate contact with the operating and competitive conditions which must be met. Nor is the Management. *It is the duty of the industrial department to inform the Managements,* clearly and analytically, as to what can be accomplished with certain rates. It is likewise their duty to work in close harmony at all times with the rate-making department.

Rates Changed When Needed

I know this works. Only recently, there was a situation here in Baltimore in which the company was threatened with the loss of a large block of existing business and failure to obtain a considerable amount of potential new business. Upon recommendation of the industrial department, *which had the facts to support its case and presented its case in a forceful manner,* the Management directed the rate department to devise a new rate which would meet the situation. That was done, successfully.

There are other matters which fall in the same general category with rates. These we call "terms of service." A utility must of necessity, in order to

Address before A. G. A. Conference on Industrial Gas Sales, Baltimore, Md., March 13 and 14, 1941.

avoid discrimination, define fixed terms under which all customers of a class will be served. Mains and services, for example, will be extended a specified number of feet without charge, after which the customer must pay for any excess. Obviously, the same terms which are applicable to domestic users are unlikely to fit the case of a prospective industrial customer. The industrial customer, who consumes many times as much gas and produces many times as much revenue, must be served under a broader arrangement. Whenever existing rules stand in the way of securing new load, the economics of which would justify a more liberal policy, *it is the responsibility of the industrial department to initiate* and urge changes in the rules.

Gas Service Worth More

One word of caution before leaving the subject of rates. The charge for industrial service should be based primarily on what that service is worth. And it is usually worth more than the bare cost of competing fuels. Furthermore, no rate should be set for industrial service which does not fully compensate for the cost of supplying the service and leave a reasonable margin of return. For when we say that a utility must avoid discrimination, we mean not only discrimination between individual customers within a class, but discrimination between classes as well. And it would be discrimination to set a non-compensatory industrial rate just to get the business.

The third responsibility of the industrial department is to develop effective promotional methods and present them for Management approval.

Success in the promotion of industrial gas depends largely upon the satisfaction you can give your customer or prospective customer. Let me use an illustration. Just as the salesman overcome sales resistance by opening his sample case and displaying his wares, you can sometimes satisfy a prospective customer on the merits of your product by giving him a trial installation or by running tests. That is displaying your wares. If requested to do so, Management will usually authorize the industrial department to spend certain limited amounts for these purposes, within its discretion. In specific cases where the contingent liability to the company exceeds the authorized limits of expenditure, the facts should be presented to the Management for special consideration. *The worst error the industrial department could commit would be to pass up a block of profitable business simply because it had not been given the prescribed authority to do what was necessary to obtain that business.*

All of these thoughts I have expressed, and others as well, might be summarized in one sentence—it is the responsibility of the industrial department to keep after the Management, to maintain close contact, and to provide the Management with factual data on which to base decisions and policies of the greatest mutual advantages to the company and its customers.

Now, having given me your courteous attention to these views from Management, you may feel inclined to ask, "If we do all these things, what will the result be?" My answer to that is the same as the answer given when a lady who had just undergone an operation asked her doctor if the scar would show. "Madam," he said, "that is up to you." In Baltimore the result, as evidenced by continued and rapid growth in industrial sales, has been good.

In conclusion, I feel that there are real opportunities awaiting the gas utilities in the industrial field—today more than ever before. The tremendous activity engendered by the national defense program offers as the occasion to serve our nation as well as our industry by increasing the utilization in industrial processes of a fuel which affords maximum dependability. How well we meet this challenge rests very largely with you.

Obsolete Gas Ranges To Provide Scrap Iron for Britain

Part of newspaper advertisement prepared by W. G. Wiegel, Lone Star advertising manager, presenting a new war-inspired copy approach

ONE obsolete gas range will provide almost enough scrap iron to make a machine gun which fires 300 shots a minute, according to figures available from the Scrap Iron for Britain campaign of which R. G. Soper, Dallas Gas Company president, is state chairman.

Shop men estimate there are 100 pounds of steel, cast iron and aluminum in an old range and as much as 25 pounds in an old water heater. It takes approximately 110 pounds to make the machine gun.

"This is one way for every person to do at least something for the vital cause of Britain and to do it with practically no expense," Mr. Soper said as he set in motion the organization which would assemble old, abandoned and useable iron from every corner of Texas. "Nothing is more important to England's defense than iron. No movement yet projected gives every person in the land a more glowing opportunity to do his bit."

During April and May, Dallas Gas Company will sponsor an old range round-up in Dallas which will be tied in closely with the campaign for scrap iron, according to C. K. Patton, new business manager, who has enlisted the cooperation of 19 Dallas range dealers for the dual campaign. Newspaper advertising will carry the theme of "Let a Modern Gas Range Help You and Let Your Old Range Help the British," and during the campaign ten new gas ranges will be given away to owners of the ten oldest ranges traded in on new ones. A special committee selected from the dealer-group will judge the oldest ranges and determine the winners.

Prospective range buyers will be notified of the campaign by newspaper advertising and by direct mail folders. Window displays and truck signs will also carry the theme of aiding Britain, illustrated with a picture of John Bull and an old gas range with wings taking it to one of the many concentration points for scrap iron to Britain.

The gas company has announced its intention of contributing all obsolete and worn-out ranges accumulated during the two-months' campaign, to the British cause.

CP—It's Your Insurance Policy

B. C. Paul, at right, star CP salesman for March, tells H. L. Hall, Fall River merchandise sales manager, which CP points carried most appeal to his customers

By H. Vinton Potter

Sales Manager, Fall River Gas Co., Fall River, Mass.

ANYTHING good is worth waiting for and all good things must be subjected to a searching gaze before they achieve the full measure of their success. If we can speak with candor, I believe it is safe to say that our early enthusiasm for the CP program may have been dampened a bit by the slow start necessarily occasioned by the announcement of the program before many manufacturers had their new models ready for country-wide distribution. Perhaps it was because we had been wishing so long for a CP program to be evolved; and perhaps too, it was because of the impatience that characterizes every sales department that we expected the program to be perfection itself almost before it was announced.

CP Program Has Arrived

True it is that many bugs had to be eliminated from the early program, but now with all of the enthusiasm that we can muster we say that the CP program has arrived at a point where no farsighted utility can afford to pass over it lightly. Again I should like to say with all frankness that the gas industry needs more glamor. Some companies have gone farther than others in supplying this necessary attribute; but we must all constantly strive to explain the romance that lies behind our industry and at every turn tell our customers that modern, amazing, yes magical things are being done with gas. Hard cold facts are appealing to some people, but there are folks who now, more than ever, are buying what fashion dictates, and we must constantly be on guard against our competition setting its products up as the smart thing to buy.

In the past we have undersold our industry and too long have been content with allowing people to use our service through the medium of cheap, makeshift, worn-out equipment; and no one, no matter how good his imagination, can visualize our present-day cooking miracles through the terms of equipment which was made 15 or 20 years ago.

The CP range stands then as a bulwark against competition, having actually provided the gas industry with a timely, hard hitting offensive program. The more people to whom we tell the enlightened story of modern cookery as exemplified by the CP range, the more will those people think well of us and our industry and the less inclined they will be to desert us for inferior fuels.

We have a stake in this cooking business—it is a profitable load and over a period of many years we have built up customer acceptance for our service which we must never relinquish. Let's write ourselves an insurance policy *now* by selling good equipment that will be way ahead of its time so that the purchasers will not only be happy that they are using our equipment but will be so pleased with its superior broiling, its almost magical baking, its vitamin-saving top burners and the many convenience features that CP offers that they will be our best publicity agents.

Here in Fall River we are no different than any other industrial city—a large portion of our population is of foreign parentage—many of our families live in crowded homes where small ranges are the only ones which can be used. Because of differences in language we have not been able to reach many of the families with our story of modern cookery; and even if we could, limited incomes would make it practically impossible to sell more than minimum equipment.

Thousands of Prospects

However, there are thousands of people to whom we can tell our enlightened story and who are potential prospects for CP ranges. It is toward these people that we are directing our efforts and right now we are getting our second breath with the CP program.

The splendid cooperation of manufacturers in providing us with superior equipment has turned any early disappointments we had into new enthusiasm; and in March we included in plans for our annual spring sale, a new attempt to sell CP. In the one month our ten men sold 340 ranges—

43 of which bore the CP seal of Cooking Perfection.

This we can promise is just a start but it is a good start toward educating our own salesmen, our gas company employees and our customers. Home Service follow-up will endeavor to impress the owners of these ranges that they have bought not an ordinary range but a superior range that is distinct from all other cooking equipment, and by spotting these ranges throughout our territory we shall be able to make each range an eloquent spokesman for modern glamorous gas service and an insurance policy for our load in that home for at least ten years to come.

Ancient Chinese Drilled Deep Natural Gas Wells by Primitive Methods

By C. M. YOUNG

Professor of Mining and Metallurgical Engineering, University of Kansas, Lawrence, Kan.

Prof. Young

DURING the preparation of the text for the University of Kansas Home Study Course in Natural Gas all available references to the early history of gas were examined. Since that time investigation has been carried on whenever an opportunity was found. Various writings on the subject indicate that gas was actually utilized, not worshipped or wondered at, in Italy, Japan, and China. Search for additional information has given only negative results for Italy, nothing at all for Japan, and interesting results for China.

No Trace of Gas in Italy

In many places there are references to the use of gas in Genoa, Italy, generally in somewhat general terms such as the statement that at an early but indefinite date natural gas was used to illuminate the city. The effort to amplify this statement has been unsuccessful and nothing has yet been found, either in references to the history of Genoa or to the history of gas, which seems even to confirm it. The only new thing found was the account of a traveler in northern Italy, a French physician, who reported about 300 years ago the occurrence of oil seeps. The material which he mentioned was described as being very volatile and, strange as it seems, the description indicates the seepage of something in the nature of distillate, for he says that when a flame is brought near to the liquid the flame passes down to the liquid, an occurrence which indicates the presence of a combustible vapor. One might expect that natural gas would be found in connection with such a liquid, but it is not mentioned.

It is true that some oil and a little natural gas are produced now in northern Italy. The gas is compressed for use as fuel in motor vehicles. Nothing has been learned about any use of gas in Genoa. The net result of the search of records is not disproof but lack of confirmation. If anyone can point out a definite reference, it will be welcome.

Nothing has been added to our knowledge of gas in Japan.

The most recent information indicates that the history of natural gas in China goes back over a period considerably longer than had been supposed. There are various references to the use of gas for the evaporation of salt brine, but most of these are somewhat indefinite. The most important publication which has come to light is an article by Louis Coldre on "Les Salines et les Puits de Feu de la Province du Se-Tchoan," or in English "The Salt Works and Gas Wells of Se-Tchoan Province," (one modern spelling is Szechuan). This was published in the "Annales des Mines" in 1891.

Chinese Wells 3500 Ft. Deep

This article gives an interesting account of the occurrence of salt and natural gas and of the drilling of wells and shows that the Chinese, with the most primitive of tools and the use of nothing but human labor as power, had drilled wells which are stated in the article to have reached the depth of 3,500 feet. It describes the method of drilling and casing and illustrates the rigs and tools.

A few years ago, and not long before the beginning of the Japanese invasion, it was learned that the Chinese were still doing this same thing in the same old way. It happens that the Japanese invasion made little change in the salt industry of this central province for it lies far beyond the Japanese lines, and the latest information is that the industry is still being operated.

A short time ago (February, 1941) there was opportunity for a talk with Dr. Oliver C. Lockhart, financial adviser to the Chinese National Government, who was then in the United States. Dr. Lockhart is familiar with the salt industry because the salt monopoly is one of the sources of support of the government, as it has been for a great number of years.

He confirmed the statement that the wells reached a depth of 3,000 feet at least, though of course not all of them are that deep, and he also said that in all probability gas had been used in this way for as long as 3,000 years.

The wells are still being drilled with primitive equipment and apparently there is no modern well-drilling machinery in use in the natural gas district.

In part these wells are cased with bamboo, but there is another practice which shows how true it often is that modern practices may be the reinvention of old ones. In a crude way the Chinese drillers cement their wells and drill out the plugs. The cement is entirely home-made consisting, at least in part, of mud from shale drilled through, mixed with the residue from the evaporation of salt brine. This is poured into the well and allowed to stand for a few days and then drilled through, leaving a coating on the sides of the well which prevents caving.

"Christmas Tree" Not New

The Christmas tree also is nothing new, for the Chinese are still using a home-made tree of their own devising. They build a box 10 or 15 feet square and invert it over the well, probably luting the contact between the box and the ground. From this box bamboo pipes go out to the evaporating kettles. The operators say that when the flame is lighted the draft draws the gas out of the box. It is evident that the gas has little pressure and that the output is small, but there is enough to evaporate a considerable quantity of brine. Part of the salt produced in China is made by evaporating sea water by solar heat, but the districts in which this process can be used are now in the hands of the Japanese. In Szechuan province evaporation is still carried on, as it has been for centuries past, by the use of artificial heat produced partly from coal and partly from gas, and Dr. Lockhart says that at the present time about 40 per cent of the salt produced with the use of artificial heat is produced with natural gas as a fuel.

It is evident that as long ago as about 3,000 years the Chinese recognized that gas was not a spirit, or at least if they thought that it was they thought that it was a good one.

Record Gas Sendout

SENDOUT of gas by Public Service Electric and Gas Company of New Jersey on March 18 totaled 119,804,000 cubic feet, the largest of any day in the company's history. This record sendout was attributed largely to increased use of gas by industries and for building heating.

Underground Storage—*An Outline of the Ohio Fuel Gas Company Method*

- **The underground storage of natural gas for peak load and emergency use as well as for conservation purposes has been a comparatively recent and important development. Today many companies in widely scattered localities are using this method of storage.**
- **Herewith the MONTHLY presents an interesting discussion of the method used in Ohio. One of the most complete symposiums ever held on this subject was that presented last May at the A. G. A. natural gas convention. This symposium is published in full in the 1940 Natural Gas Proceedings which are available at Association headquarters.**

By KENNETH C. COTTINGHAM

Chief Geologist, The Ohio Fuel Gas Co., Columbus, Ohio

IT is an army custom, I have been told, to challenge any change of policy or method with three questions. Those questions are: Why do it? Why do it now? Why do it this way?

When, in 1935, plans were first made to store gas in the Clinton sand, the undertaking was diagnosed more thoroughly than these three pointed questions would imply, and yet they *do* form the elements leading to the decision in favor of underground storage. Looking back, now, we might use those questions as a framework upon which to display the development of the idea.

First, then—why do it?

Fields Decline with Use

We all know that wells and the fields from which the wells produce decline with use. We know that gas having been produced is not replaced. Some of us have experienced, and all of us have knowledge of shortages due to the exhaustion of adjacent supplies—Findlay and Toledo, and for that matter, Columbus, in the early days of natural gas. If gas could be moved in off-peak seasons—in the summer, in other words—if it could be moved in even quantities and somewhat at leisure; if it could be confined in large volume near markets or transit lines; if, finally, it could be confined at a reasonably high pressure, all these factors would be a tremendous advantage to otherwise overloaded lines and equipment.

The general idea, if practicable would save waste, would concentrate the manual operations of many widespread wells to a few localized wells during peak periods, and would lengthen the life of production in Ohio and elsewhere. At the same time, it would make possible the purchase of gas during periods of slack demand or excess production. The idea is not new. Storage of gas on a smaller scale had been tried south of Buffalo, near Louisville, Kentucky, in eastern Kentucky, at Bow Island in southern Alberta, and elsewhere. From the fact that such storage had been successful and the additional fact that sands in Ohio would seem to be adaptable to it, the idea of underground storage was approved for further investigation.

So much for the answer to "Why do it?"

"Why do it *now*?"

The winter of 1935-1936 made the fact apparent that The Ohio Fuel Gas Company must plan additions of some sort—wells, lines, and compressors—to meet peak demands. Additional Ohio wells might have solved the problem, but it would be only a temporary solution and the number of wells and cost would be excessive. If the life of Ohio production were to be prolonged, then a beginning must be made while West Virginia, Kentucky and other out-of-state sources were still abundant. For the plan in mind, the required pressures would have been excessive, particularly for compressors, only a few years earlier. Now—that is, in 1935—there was no mechanical difficulty in carrying the plan through, and so, late in 1935 it was decided that the idea of underground storage be thoroughly examined. And that brought us, though not as tersely and abruptly as I am putting it here, to—

"Why do it this way?"

Now let me say that we do not feel that the underground storage is the only method, or that it is necessarily superior for all requirements. It does, however, fit our needs particularly well and that is the final test of any plan. In answer to "why do it this way?" I am going to tell you something about our general physical plan and needs.

Why Storage Necessary

Our operations in Ohio cover an over-all area of approximately 29,000 square miles. We have 38 compressor stations, some 7,000 miles of transmission lines, and serve, wholesale and retail, about 700,000 customers. Our problem is difficult because it is an assemblage of individual problems scattered over a wide area. If it would be possible to store large volumes of gas under high pressure *close to* existing compressors and transmission lines, then we could take gas from West Virginia during the summer—when it would otherwise be shut in—and we could store it, as well as the energy it contained in the form of pressure, in huge, relatively inexpensive, natural holders in the sand. We could avoid the necessity of an additional line to West Virginia because we could use existing lines during off-peak periods. We could, further, have volumes of gas under pressures approaching those of new fields, convenient to mechanical facilities, and ready to be moved to any part of our

Presented before Ohio Gas and Oil Men's Association, December 6, 1940.

territory. One of the most favorable features of storage of this type would be that, with little modification, existing equipment and investment could be used.

So much for a brief resumé of the "Whys" of storage. I might outline for you how the particular areas were chosen and tell you something of how they have operated.

Gas "sands," as they are called, are not sands in the sense that they are unconsolidated. They are rocks, and the gas is contained between the grains, or in the "pore spaces" of the rock. Percent porosity, the usual way of expressing porosity quantitatively, is the ratio of the total volume of a piece of the rock to the openings within it. As an analogy, suppose you have a container of one cubic foot volume and you fill it level with marbles. To determine the pore space, you pour water around the marbles until the water has filled all the remaining space. You find that, to do this, you have poured one-fourth cubic foot of water.

The theoretical porosity in this example, then, is ¼ divided by 1, or 25%.

Porosity and Permeability Factors

In the areas in the Clinton sand in which gas is stored, the porosity ranges between 12% and 15%. Now, other things being equal, the greater the porosity the more easily will gas pass through sand. But there is another factor to be considered, and that is permeability. Sand grains may have such shapes and arrangements that, even though the porosity be reasonably high, the permeability may be poor and thus restrict the flow. If, as a rather extreme case, a sand contained as an important constituent flakes of mica, arranged in random planes and angles, the porosity might still be high while the permeability factor would be low. Therefore, a preliminary step in choosing a reservoir sand is to study the past production from the area. If an area, or pool, can be found where the wells yielded their gas rapidly—if, in another way of putting it, the wells had large initial open flows—then that pool, so far as porosity and permeability are concerned, would be suitable for storage.

The Clinton sand, in which we store gas, is peculiar in that much of it lies in irregular patches. Moreover, these irregular patches are lense-like, that is, the surfaces converge or pinch out much like a lense. These lensed formations—the adjective which you so often hear the geologist use is "lenticular"—the lensed sand bodies are usually surrounded by shales which are impervious. Therefore, if an isolated lens can be found which also has good porosity and permeability, then a reservoir has been found which will hold large volumes of gas, which will take and yield gas rapidly, and from which stored gas will not escape.

Dry Reservoir Sought

Most sands contain water, and some of them contain water which is under a hydrostatic head and therefore very active. Now water in a sand might not be a reason to avoid it, but at best, there probably would be a capillary effect with some moisture scattered throughout the sand, thus reducing both porosity and permeability. The Clinton is peculiar here again in that it does not contain any appreciable water, and never to my knowledge has contained active water. And so, we have still another reason to choose the Clinton as a storage reservoir—the fact that it is dry.

One requisite of the plan of underground storage, as you have been told, was that existing equipment be used wherever possible. Consequently an old Clinton area near Crawford Station in Hocking County was one of the first to be investigated. One of the first pools examined in this area contained old wells in which the rock pressure was approaching abandonment—44 pounds to be exact—and the lens from which the wells produced was almost entirely encircled by dry holes. Beyond the dry holes were more producing wells having rock pressures of some 200 pounds. In all, three adjacent pools were chosen, and these are known as the Benton Storage area, named from Benton Township, Hocking County. A short time afterward, another project was begun in Ashland and Richland Counties, known as the Perrysville area.

The Benton project contains about 10,000 acres and is made up of three separate pools. The depth to the Clinton averages 2200 feet and the wells when first completed in 1917 had original rock pressures of 900 pounds. When storage began in 1936 the rock pressure averaged about 80 pounds. The pressure today is approximately 575 pounds.

Perrysville contains a total of some 11,000 acres and is also made up of three pools. The depth to the Clinton is approximately 2600 feet, and when first completed the wells showed a rock pressure of about 1200 pounds. At the beginning of storage the rock pressure was approximately 120 pounds. Today the pressure is in the neighborhood of 610 pounds. The two storage projects contain 119 storage wells.

The volume of gas held in storage is important, to be sure. It corresponds to the reserves drawn upon by the ordinary well. But, just as in the case of the normally producing gas well, reserves are but one function of the well. The other function is the *rate at which* the gas can be delivered by the well. And with that in mind, I would like to point out that these 119 wells are equivalent in daily delivery to more than 1300 average Ohio wells. Here, in another way of putting it, are 119 wells in two compact areas yielding as much gas as 1300 widely scattered wells. This geographic compactness makes it much easier to increase or reduce deliveries with sudden changes in demand.

A. G. A. Report

In a discussion before the American Gas Association last May, S. A. Chadwell covered the history, the development and the effect—particularly as it touches transmission—of our storage. Mr. Chadwell pointed out that in the case of lines carrying gas into our system from outside Ohio, the load factor increased 17% between 1935 and 1938, and this 17% improvement he attributes entirely to storage. He also stated that the pressure with which the gas is forced into the storage reservoir is preserved as energy until the gas is removed. This he terms "storage of horsepower."

This last feature is not well realized by one outside the industry. We know that volume without sufficient pressure is not worth a great deal to us. Volume without pressure is very much like water at sea level. Water in that situation has no intrinsic energy because, practically, gravity has no further effect on

it. In other words, the water will not flow; neither will gas, no matter what the volume, flow at atmospheric pressure. Storage pressure, then, is valuable because it is intrinsic energy. That energy is added when the gas is compressed for storage, and it is preserved until used to move the gas from storage to the consumer.

It is not the intention, and as you have seen, it has not been the practice to store gas for a remote future. The plan is not a savings account, but rather a checking account. In the time that storage has been in operation, even though the reservoirs have not been entirely filled, we have to date stored an overall total of 26 billion cubic feet, leaving in storage at present 14 billion cubic feet. We believe that the projects will hold a minimum of 20 billion cubic feet.

It must be remembered that, following an input period, the pressure gradient is coned about each well and although these cones seem to subside rapidly, it still takes time for the gas to move to the far reaches of the sand. The coning of pressures accounts for the fact that storage wells, if used for short periods, yield more rapidly than average ordinary wells even though the latter may have larger reserves sustaining them. Intermittent and repeated input tends to keep the gradients coned around storage wells. In the case of ordinary wells, even though there may be a large volume of gas in the entire areas adjacent to them, the pressure gradient is depressed around the well. In short, the pressure is greater and the radial distance to the hole is less in the storage well.

Reviewing briefly, then, the method is to put gas into the storage reservoirs when lines and equipment are not loaded with winter deliveries, or when there may be no market for gas in transit. Although the general purpose is to supply gas seasonally, storage is ready at any time to meet emergencies or to relieve congestion should demand suddenly decrease.

Storage of gas near markets is no longer in the theoretical stage but is a practical part of our operations. It is being studied in some form and is being applied throughout the industry wherever supplies are brought from increasing distances.

Vigorous Gas Cooking Campaign Uses "Success" Theme

IF so many buy it, it must be good—is the psychology behind the current advertising campaign of the Boston Consolidated Gas Company. In a cleverly conceived and attractively laid out series of advertisements similar to the one illustrated here, appearing in all Boston newspapers, the company is capitalizing on the popularity of the modern gas range as shown by its overwhelming sales leadership year after year.

MORE GAS RANGES SOLD LAST YEAR THAN EVER BEFORE . . .
America's No.1 choice!
TASTE WHY GAS COOKING IS WAY AHEAD
$106
BOSTON CONSOLIDATED GAS COMPANY

Gerald Higgins, advertising manager of the company, who originated the campaign, feels that this type of aggressive promotion is the story other gas utilities should be telling in a concerted group effort. He strongly believes that whatever hold electric cooking may have on the general public is chiefly psychological and not justified by performance. He expresses his sales philosophy as follows:

"I know of no better way to counteract any negative attitude customers may have toward the future of gas cooking vs. electric cooking (as tentatively revealed by Elmo Roper's surveys) than to present strongly and proudly our own present success in the gas cooking market. The *figures* do not show gas cooking slipping—indeed, they show greater sales of gas ranges in 1940 than ever before in our history. This is a truth we can take and turn to a very eloquent advantage, with quite dramatic possibilities.

"Although this is its major, re-echoing theme, our campaign also uses scores of recipes to drive home and prove the facts of gas superiority—the copy angle growing vigorously from the recipes themselves in specific proof of *why* Gas Cooking is America's No. 1 Choice. Recipes have been chosen, too, for their high attention value with women readers and, secondly, for their load-building possibilities. By this plan we are able to place four or five gas-using recipes, with gas slogans on each, before 1,400,000 women every time an ad appears in all Boston papers—and we are placing 12 such ads this Spring. Many of these recipes we know will find their permanent way into kitchens."

Bob Hope Says It in "Road to Zanzibar"

WHOSOEVER in the gas industry takes a safari to one of the cinema palaces showing "Road to Zanzibar" will be doubly repaid. Bing Crosby and Bob Hope as roving carnival performers who eventually make a safari through the jungles of the Dark Continent set up on the Paramount Lot provide plenty of hilarious adventure, are quick with their quips, and beat out a swell routine on dust covered drums they find in the cannibals' caves.

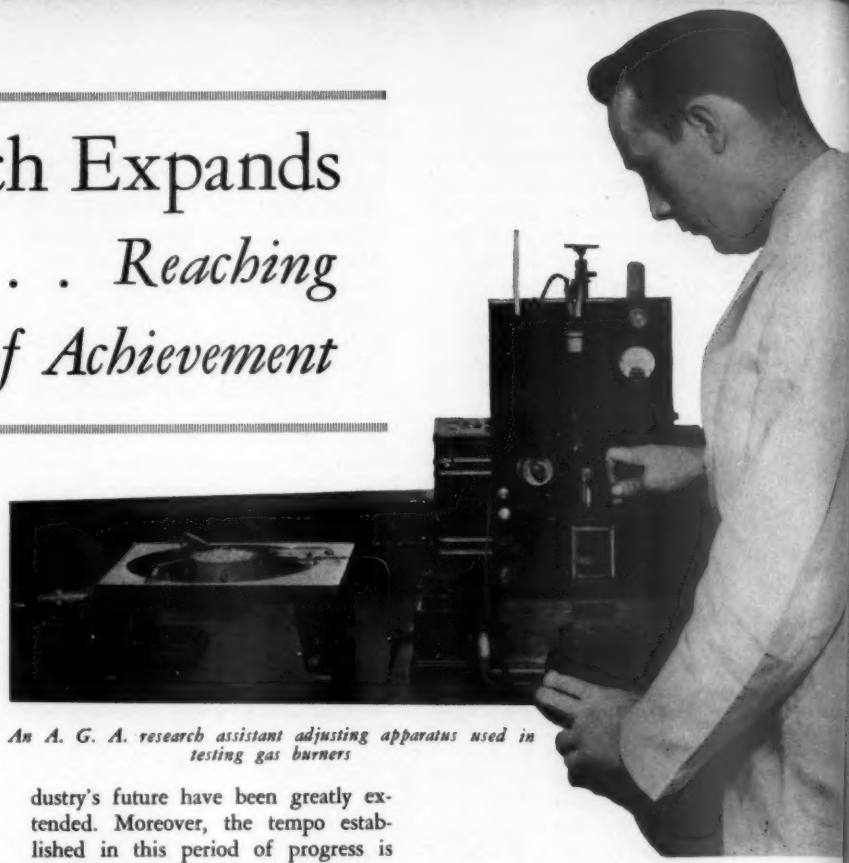
And there's Dorothy Lamour for Romance . . . Dorothy strumming a guitar . . . Dorothy cooling off in a jungle pool . . . Dorothy frocked in a "one-piece" of fern fronds. . . .

As the movie editor of the *New York Times* reported on the film: "Needless to say, Mr. Crosby and Mr. Hope are most, if not all, of the show—with a slight edge in favor of the latter, in case any one wants to know. . . . Farce of this sort very seldom comes off with complete effect, but this time it does. . . . This time, as Mr. Hope puts it in one of his pungent phrases, *they're cooking with gas.*"

Gas Research Expands Frontiers . . . *Reaching New Heights of Achievement*

By R. M. CONNER

Director, American Gas Association Testing Laboratories



An A. G. A. research assistant adjusting apparatus used in testing gas burners

IMPROVEMENT in domestic gas appliances, and commercial and industrial utilization of gas has been so gradual and except in some cases so devoid of spectacular accomplishments that the remarkable progress which has taken place in recent years is not fully appreciated. Yet, within the last fifteen years more progress has been achieved in the gas industry than in the past fifty. Some of the tangible improvements attained in this period have resulted in safer, more efficient and dependable gas-burning equipment. Fifteen years ago a high percentage of gas appliances would not comply with combustion and performance standards now commonly accepted. This high level of operation has been brought about by application in manufacturing processes of scientific principles largely developed by research.

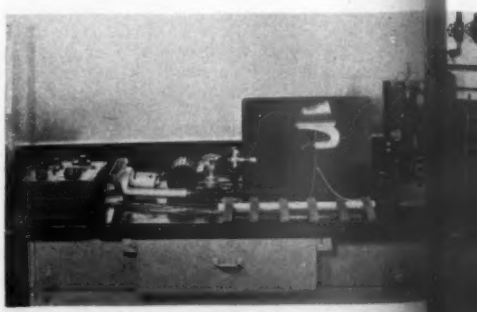
No one can deny this record of achievement. It accounts, no doubt, for the steady increase in domestic gas users since 1933, as well as the more rapid increase in commercial and industrial gas loads through adverse times, depressions and recessions, in spite of increasing competition from competitive fuels. New uses for gas are being found almost daily. Furthermore, new developments and improvements point to better gas appliances and better gas service. Based on research, the frontiers of our industry's future have been greatly extended. Moreover, the tempo established in this period of progress is being carried on with greater vigor than ever before.

Many agencies have been engaged in investigating problems relating to gas appliances, gas production, distribution, and utilization. Through the American Gas Association, gas companies and gas appliance manufacturers have cooperated in promoting research for their mutual benefit and in behalf of their consumers. With establishment of the American Gas Association Testing Laboratories in 1925 it was only natural that they should become the center of these investigations.

$750,000 Spent on Research

Nearly three quarters of a million dollars have been expended in research investigations conducted at the Laboratories since their inception. A large volume of timely, important, and useful studies has been completed. Since 1925 more than 500 fundamental reports and some 37 major bulletins have been provided. These have frequently been judged as outstanding contributions to the gas industry. The data obtained and the conclusions reached have been of enormous value in themselves. Studies on mixing of gas and cast iron pipe joints represent two outstanding examples. In the commercial field data secured on costs and values of different fuels for cooking and water heating serve to apprise our industry of its competitive advantages and disadvantages. The lack of merit of numerous gadgets purported to be "gas savers" has been exposed.

Under supervision of the Committee on Industrial Gas Research, F. J. Rutledge, chairman, four extensive projects summarized in six bulletins have



Test apparatus for determining lifting and yellow tip limits on a burner with variable port depth, size, spacing, and number of rows of ports

been prepared on combustion phenomena in industrial processes under high temperature conditions. This work has covered primarily combustion of gas with oxidizing atmospheres. It has involved the development of new techniques which have proved invaluable in modern industrial practices.

Recently the first bulletin on combustion of gas under reducing conditions was published, summarizing the last three years of investigation on this problem. This is entitled "Composition of Furnace Atmospheres Resulting from Partial Combustion of Gaseous Fuels," Bulletin No. 11. Data presented therein have already been put into use in preparation of special furnace atmospheres in speeding up processing of metals, thereby extending the use of industrial gas in many new fields. Additional possibilities are revealed by this study. As a result, further investigations along lines indicated by this preliminary work are now under way.

Domestic Gas Research

In 1935 a noteworthy program of research on domestic gas appliances was inaugurated by the Committee on Domestic Gas Research, also headed by Mr. Rutledge. Already much valuable fundamental information has been presented in four major bulletins on gas ranges, water heaters, and atmospheric burner design. These have been enthusiastically received both in the United States and abroad. Continuation of this program and its extension to cover other major domestic gas appliances are in progress.

Assisting the Committee on Domestic Gas Research in supervising the various projects on domestic gas appliances are a number of technical advisory committees appointed by the Association of Gas Appliance and Equipment Manufacturers. Arthur Stockstrom, president of the American Stove Company, is chairman of the Technical Advisory Committee on Domestic Gas Range Research. L. R. Mendelson, president of the Hotstream Heater Company, heads a similar committee on domestic gas water heating research. J. W. Farren, engineer of products, Bastian-Morley Company, is chairman of the Central Gas Space Heating Research Committee, and J. S. Drillette, vice-president of the Peerless Manufacturing Corporation, chairman of the Direct Gas Space Heating Research Committee. Assistance of these advisory groups has proved invaluable in the conduct of projects of immediate importance and value now under investigation.

THE LABORATORIES' RESEARCH STAFF

Seated, left to right: H. F. Butze, W. B. Kirk, R. M. Conner, director, F. E. Vandaveer, F. O. Suffron, and E. J. Weber. Standing, left to right: J. A. Sneller, R. C. Rahn, Bhagat Singh, H. L. McPherson, G. J. Pacanovsky, F. R. Sackett, F. E. Hodgdon, H. L. Burns, H. F. Kascher, and F. J. Pryatel

Top Burners Studied

One of the most outstanding projects in this entire program is a study of gas range top burners. A considerable number of improvements in contemporary range top burners have resulted from closer control of such factors as secondary aeration, closer spacing of burners to utensils, decrease of metal thickness of grates, reduced contact of pan and grate with top surface improved injection tubes and orifices, and horizontal drilling of ports.

Arrangement of apparatus for studying stratification of hot water in automatic storage water heaters

An entirely different conception of burner design is the object of a current investigation. Top burners of conventional design inject 50-70% of the air required for complete combustion. They depend on secondary aeration to complete the chemical reaction for complete combustion and require additional combustion space for this to take place. Burners which will inject all of the air required for complete combustion as primary air offer possibilities for further advancement. They would allow exclusion of provisions for secondary air, and permit a utensil to rest practically on the burner and to operate with increased thermal efficiency.

Results of preliminary investigations on 100% primary air injection burners have thus far proved promising. Ten out of sixteen burners designed for this purpose injected more than 100% of the air required for complete combustion, the percentage ranging from 100 to 200. While this work is by no means completed and all the difficulties have not been eliminated, some of the designs studied lend themselves to future application. It is believed that proper combination of improved mixing tubes, port arrangement, and rating hold the key to new and more satisfactory designs.

A second study now under way supplements the work summarized in Bulletin No. 10, "Fundamentals of Atmospheric Gas Burner Design," published in March, 1940. In this bulletin our general knowledge of design of small burners, satisfactory flame char-

acteristics, good primary air injection, and quiet burner operation was materially advanced. It did not, however, cover special problems relating to larger and longer burners which are commonly used in space heaters, large water heaters, and central heating equipment. Technical knowledge of flexibility of burner performance indicated by satisfactory flame characteristics for these important applications is essential. This includes such variables as form and arrangement of ports with respect to each other, depth, size and spacing of ports, and burner head and air-gas mixture temperatures, all of which are primary factors controlling lifting, flash-back and yellow tip limits. Such information will enable a designer to evaluate these interrelated variables to secure better performance.

Water Heating Investigation

Popular interest created by Bulletin No. 9, "Fundamentals of Gas Water Heating," has indicated the need for still further clarification of problems in water heating. Active work on one of these problems, stratification of hot water in storage type heaters, was initiated late in September, 1940. Sufficient data have now been obtained to warrant its discussion. Theoretically, if perfect stratification were obtainable, the maximum hot water which could be withdrawn from a vessel would approach its storage capacity. Actually, however, inter-mixing of the hot water with cold water reduces outlet water temperatures. To obtain the amount of hot water theoretically available, it would be necessary to resort to a larger storage vessel.

Other practical aspects of benefits derived from proper stratification are those of thermal efficiency and corrosion. It has been shown in previous work that in heating water from 75 to 165° F., efficiencies of modern heaters range as much as 8% higher than those obtained when heating water from 120 to 165° F. It is further known that improper stratification is correlated with increased corrosion in water heaters. Agitation within the storage vessel causes oxygen in the cold inlet water to be thrown out of solution and deposited on the metal surfaces of the storage vessel. Moreover, it also tends to wash off protective films of hydrogen, alkaline salts, and rust formations, which if undisturbed might retard further corrosion. Thus, the advantages of obtaining satisfactory stratification of hot storage water from cold inlet water are apparent.

It was determined in this investigation that inter-mixing of hot and cold water is more pronounced with shorter dip tubes in relation to the height of the storage vessel. The effect of average water-line pressures is not appreciable. However, as the rate of drawing water is increased, the percentge of stored heat delivered in usable form is decreased. One of the tangible conclusions reached during the tests conducted to date indicates that the direction of inlet water entering the storage vessel can be controlled, thereby influencing to some degree stratification. It is believed that service efficiencies can be increased and propensity of water heaters to corrode decreased by suitably controlling this factor.

Other Projects

The work described above by no means covers all the projects now under way. Fundamental studies on range top burner lighting will afford considerable information on limiting factors of automatic lighting, when completed. Those on space heaters and central heating gas appliances include such factors as design and heat transfer, as well as noise of operation. In the study of noise, a relatively unexplored field, methods are now being developed for determining not only the intensity of noises but their source.

The Laboratories' research staff now totals sixteen, the largest number in their history. A few comments about this group of men in addition to the information given on one of the accompanying photographs will summarize its general qualifications. Dr. F. E. Vandaveer, assistant director and in direct charge of research, has been with the Laboratories since 1925. He was previously associated with The Peoples Gas Light & Coke Company. He received his Ph.D. in Industrial Chemistry from the University of Illinois, where he was also the recipient of a fellowship from the Illinois Gas Association. During his years of service to the gas industry he has become recognized as an outstanding authority on gas analysis.

Assisting Dr. Vandaveer in administering the broad scope of domestic and industrial research activities is F. O. Suffron, who has had wide experience in various industrial pursuits in addition to 24 years in the gas business. W. B. Kirk is in charge of requirements research and air conditioning testing. He has been engaged in various research capacities for nearly 11 years, including four at the Laboratories. All the members of this group, with exception of the librarian, are graduate engineers. Two are Doctors of Philosophy; one holds a Mechanical Engineering degree; and two have Master of Science degrees in chemical engineering. A majority of the staff, moreover, have taken and are continuing to take advanced courses of study in allied subjects at local universities. Their academic preparation in a large number of technical fields, combined with basic training in the gas business itself, affords ideal qualifications for conduct of many of its problems.

Air Conditioning Research

Indeed, these qualifications, as well as the Laboratories' notable record of past research accomplishments, have not gone by unnoticed. Under supervision of the Committee of Executives on Air Conditioning, of which Davis DeBard is Chairman, and the Joint Committee on Summer Air Conditioning of the Industrial & Commercial Section of the Residential Section, headed by Charles R. Bellamy, the Laboratories were recently assigned an extensive program of test work on summer gas air conditioning appliances. The importance of this program is self-evident. Employed during the summer low-peak period, it represents a particularly desirable load for the gas business. This investigation, conducted on an impartial basis, should apprise the industry of the engineering and economic status of gas-fired summer air conditioning appliances. It should also reveal actual performance under controlled laboratory conditions in comparison with theoretical limitations. Moreover, it is hoped that it will serve to stimulate further improvement in contemporary summer air conditioning equipment, and at even more rapid rate.

Gas Industry Gains as Reflected in Annual Reports for 1940

Consolidated Edison Company of New York, Inc.

In an attractive, personalized report to employees entitled "Our Company and Our Business," this great metropolitan company gives a simplified picture of its functions as a business organization.

A noteworthy feature of the report is the break-up of the average dollar of revenue received in 1940. Under the heading, "The Money Goes Out," it is shown that the largest share went to labor—26.6 cents for wages, salaries and pensions. Tax collectors received the second largest share, 22.8 cents. Coal material and supplies took 18.9 cents and depreciation 10.3 cents. Interest on borrowed money amounted to 7.2 cents, leaving 4.2 cents for dividends on preferred stock, 9.0 cents for dividends on common stock and 1.0 cents for surplus.

Taxes of Consolidated Edison and system companies amounted to $1626 for the average employee during 1940, according to the report. The total tax bill more than doubled in ten years, taxes rising from 29 million in 1930 to 58½ million in 1940. The company is New York City's largest taxpayer.

In 1940 the average pay of weekly employees of the System companies was $37.85 including overtime. In 1939 the average weekly pay was $37.13. The report points out that the average investment per employee is $35,000.

Revenue from the sales of gas during the year increased 1.6 per cent as compared with 2.3 per cent for electricity.

The report is liberally illustrated with photographs and charts. One picture of an automobile carries a caption indicating that a fleet of 1,407 cars and trucks are necessary to carry on the business. These cars travelled 13,600,000 miles in 1940.

Pacific Lighting Corporation

Although the national defense program was still largely in a preliminary stage at the year end, it had already had a marked influence on business conditions in Southern California, according to the annual report of the Pacific Lighting Corporation. During the year the building of new dwellings continued at boom levels, 48,600 units being completed, as compared with 39,537 for 1939 and 27,104 for 1938. The preponderance of this construction occurred in Los Angeles County, where the aircraft manufacturing centers are located and where much of the defense work in other industry is taking place.

Special efforts were made to inform the owners and occupants of these new residences of the superior performance and appearance of gas-burning appliances. As a result, in the new homes completed during 1940, gas heating appliances were installed in 99 per cent of the cases, gas water heaters in 95 per cent, gas ranges in 92 per cent, and gas refrigerators in 19 per cent of the new dwellings.

The sale of 30,750 Certified Performance gas ranges in 1940 was said to represent the greatest ratio of sales per meter of this high quality range for any gas system in the United States.

Increasingly more forced air gas furnaces are being installed in both existing and new dwellings in Southern California, and a campaign to educate consumers to the convenience and effectiveness of permanently located vented heating appliances of adequate capacity is bearing fruit. Over 60 per cent of the heating equipment installed in new dwellings in 1940 was permanently located and vented.

Total sales of gas appliances through dealer and company outlets were: 96,000 ranges, 117,600 refrigerators and water heaters, 38,100 central heating plants and floor furnaces, and 107,000 space heaters.

The United Gas Improvement Company

The combined earnings statement of The United Gas Improvement Company and subsidiaries shows, in the company's fifty-ninth annual report, earnings of $1.04 per share for its common stock for 1940, which compared with $1.07 for 1939. Operating revenues of utility subsidiaries amounted to $118,977,217, an increase of 5.9 per cent.

Total sales of gas increased from 19,310,067 M cubic feet in 1939 to 20,702,071 M cubic feet in 1940. The number of gas customers rose from 453,121 in 1939 to 463,082 in 1940. These figures are exclusive of The Philadelphia Gas Works Company.

Taxes for 1940 were equivalent to 15.3 per cent of operating revenue, more than double the figure of 7.5 per cent registered in 1930.

The Philadelphia Gas Works Company sold 19,140,536 M cubic feet of gas during 1940, an incerase of 7.1 per cent over the previous year. Sales to domestic, commercial, industrial and house heating customers increased. The number of active meters increased from 475,998 to 476,292. Operating revenues increased 3.0 per cent.

The Hartford Gas Company

The ninety-first year of operations of The Hartford Gas Company ended with the greatest volume of gas sales in the history of the company. Total gas sales increased 9.8 per cent over 1939 while operating revenue jumped 6.7 per cent.

There was a substantial increase in residential use of gas for the "4 Big Jobs" of cooking, refrigeration, water heating and house heating. Climaxing a five-year period of growth, residential sales increased 5 per cent over 1939. This increase was attributed to the greater acceptance of gas service for household purposes which more than offset the savings to customers who replaced old and less efficient appliances with modern gas equipment of greater efficiency.

Commercial gas sales rose 17.2 per cent and industrial gas sales were up 35 per cent, reflecting the great activity of industrial plants using gas for heat-treating purposes.

Certified Performance gas ranges continued to increase during 1940 to the point where this type of range represented a substantial portion of the company's gas range sales. The kitchen heating gas range, combining automatic controlled kitchen heating with modern gas cookery, continued to gain in popularity, showing a 53 per cent increase.

Automatic water heating and gas refrigeration made substantial gains while gas house heating increased 23 per cent.

Noting that gas is taking a leading part in the national defense program, the report points out that there has been much improvement in the development of gas-fired industrial equipment due to cooperative research and engineering by utilities and manufacturers. The sales promotional activities of the American Gas Association and its national advertising program were commended.

Wisconsin Public Service Corporation

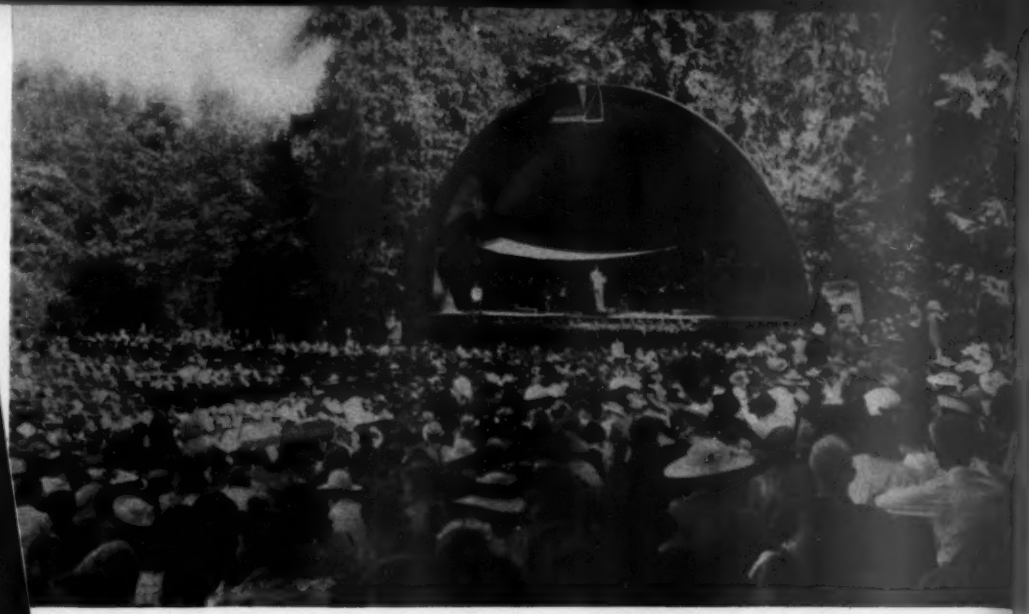
Total income of the Wisconsin Public Service Corporation from all sources amounted to $9,777,239.39, the highest in the company's history and 6.3% above 1939. Taxes increased 22.6 per cent and net income 10 per cent.

Gas revenues increased slightly and total sales of gas amounted to 1,144 million cubic feet, 23 million cubic feet more than the previous year. Residential gas sales, which account for 83 per cent of the company's gas revenue, showed an increase in cubic feet sold of 2.7 per cent. Gas customers served increased 3.1 per cent to 42,617.

An encouraging number of gas appliances was sold in 1940, with automatic water heaters on the company's lines increasing 34 per cent and new house heating installations making steady gains.

California Natural Gas Consumption Up 12%

NATURAL gas consumption in California in January of this year totaled 22,679,599,000 cubic feet, a new high total exceeding requirements for the same month a year ago by 11.6 per cent.



Crowd of 10,000 people listening to concert of Vancouver Symphony orchestra in Stanley Park, Vancouver, B. C., sponsored by the local gas and electric company. The conductor below is Allard de Ridder, distinguished Dutch leader

Music Hath Charms . . . *An Old Saying with a New Meaning*

Music is a universal language as it is the outlet for the emotions of all classes of people. A study of the music of any land or of any race of people will show definite traits of character. As America is made up of many races and many types of people, so is her music, and the emotions of every American are appealed to by the music of the land. To help satisfy this craving of the population, three public-spirited utility companies have proved themselves to be better citizens of their communities by making it possible for large numbers of their customers to hear good music.

IT has always been the opinion of William G. Murrin, president of the British Columbia Electric Railway Company which supplies gas and electric service as well as transportation in Vancouver and Victoria, British Columbia, that one of the best ways to get public goodwill is to do something of a community-spirited nature.

About 1934, when he was casting about for a means of contributing something of a worthwhile nature to the communities served by his company, two developments took place in Vancouver which gave him a lead.

The first was the re-establishment of the Vancouver Symphony orchestra under the direction of Allard de Ridder, a distinguished Dutch conductor and the second was the building of the Malkin Memorial shell in Stanley Park, the gift of a public-spirited citizen of Vancouver.

The symphony orchestra, owing to the absence of a large public auditorium in Vancouver, could play only in a theatre on Sunday afternoon—there are no Sunday shows in Vancouver—and therefore live symphony music other than by radio was denied most of the people of the city.

- **This is the seventh of a series of articles appearing in the MONTHLY dealing with community development activities. Under the chairmanship of H. C. Thuerk, the Community Development Committee is presenting a variety of tested ideas that may be used by large or small companies.**
- **Preparation of the material is directed by the committee's editorial board consisting of John H. Warden, Oklahoma Natural Gas Co., Tulsa, Okla., and G. A. Saas, Citizens Gas and Coke Utility, Indianapolis, Ind.**

Could this music, thought Mr. Murrin, not be made available free to tens of thousands of people in one of the public parks? The opportunity came when the Malkin Memorial shell was built. Situated in a natural lawn covered depression in one of the famous parks of the world, it supplies an ideal setting for "Symphonies under the Trees."

When, therefore, the British Columbia Electric announced a series of five free symphony concerts in July and August of 1934 it was acclaimed not only by symphony lovers but by the general public. The first concert drew a crowd of 25,000 which spread over the grass and under the trees far beyond the chairs which the park board provided at a nominal charge. Amplifiers make hearing possible far beyond the immediate vicinity of the shell.

Repeated Program

Every summer since then the company has repeated its program. Five concerts are given two weeks apart on Sunday afternoons. They last from 3 to 5 o'clock. If it turns out to be a de-

cidedly rainy day, the concert is postponed until the following Sunday.

The attendance varies from 5,000 to 15,000, depending on weather, counter attractions and other factors; but the concerts appear to be gaining in popularity.

No Commercials Used

As to the program itself, no commercials are used. The announcer merely gives out the titles of the numbers and mentions from time to time that the concerts are donated by the British Columbia Electric Railway Company.

Outside Talent

Besides the orchestral numbers, a soloist is generally provided. This may be an outstanding vocalist, pianist or violinist. While local artists are given every encouragement, world-famous pianists and singers have appeared on the program.

As the concerts are looked upon as merely an extension of the winter series of the Vancouver Symphony society, it has been possible to have visiting conductors of continent-wide reputation take the baton on special occasions. At one concert in the summer of 1940 the adjudicator of the Vancouver musical festival, a professor from the University of Saskatchewan, in the course of a short speech from the platform, expressed his surprise at finding concerts donated by a public utility company, an indication that here was a company with a soul.

Program Extended to Victoria

Following the success of the Vancouver series, the company three years ago began the donation of three open-air evening concerts in Victoria, capital city of British Columbia. They are given by the Victoria Philharmonic orchestra and so popular were the first two seasons' concerts, that in 1940 they were increased to four. They are presented in Beacon Hill park.

Not the least of the commendations come to the company from the members of the Symphony and Philharmonic associations for the concerts enable them to keep their orchestras together and rehearsing through the summer, a time when they otherwise drift apart.

California Radio Program Brings Results

Another example of music's being used to good advantage by a utility is the series of Evening Concert broadcasts being sponsored jointly by the Southern California Gas Company and the Southern Counties Gas Company.

According to J. S. Spaulding, advertising manager of the Southern California Gas Company, these concerts are broadcast continuously from eight to ten o'clock six nights each week, or a total of 624 broadcasting hours a year.

The purpose of these concerts is to bring good music to the homes of the customers of these two companies. The thousands of comments volunteered at the gas companies' offices furnish undeniable proof that their program is one of the most outstanding radio attractions in that part of the country. Against the peak competition of five net work stations, Evening Concerts has increased its listening audience over 400 per cent since October, which was the first month of the series. The rating is based on the Hooper Radio Reports and Facts Consolidated, both of which are issued monthly.

The increase in the listening audience is further corroborated by the increase in customers coming into the offices and requesting copies of the month's printed program, requests having increased from 11,000 in October to over 16,000 in February and are expected to reach 20,000 monthly by the end of May.

Institutions Recognize Program

The cultural achievement of this effort may be measured in another way—by the recognition received from public offices or organizations, as follows:

1. Los Angeles City school system.
2. Los Angeles County school system.
3. School Boards in Burbank, Glendale, Pasadena and elsewhere.
4. Librarians, both in Los Angeles and Pasadena, who report that music department reference demand has increased notably since the program started.
5. Musical organizations in various cities, including the Los Angeles Philharmonic Association.
6. Many other groups, including professional people.

Similar programs are being sponsored by the Pacific Gas & Electric Company in the San Francisco area and by the Portland Gas & Coke Company in the Portland area.

These programs are two more examples of companies that have helped their communities and themselves by doing things not directly connected with their primary job of serving gas. The appreciation which these companies have gained from their sponsorship of the musical programs proves conclusively that music is a universal language.

On the air! "Your gas company welcomes you to another in a series of Evening Concerts," says Perry King, maestro for the popular Southern California program of radio offerings

Sponsor National Fire Prevention Program

CONCURRENT with the 75th anniversary of its founding in 1866 by capital stock fire insurance companies, the National Board of Fire Underwriters is calling upon the American Gas Association and more than 40,000 other organizations and individuals to unite in a vigorous program to create a stronger national defense through a more efficient fire defense.

"The fury of the flame does not bow before the unprepared," is the theme of the nationwide campaign which will be climaxed by a national celebration ending the anniversary week of May 21 to 28. Special anniversary events will be held in New York City on May 27 and 28. During these commemorative events, the importance of fire prevention and fire protection will be impressed upon the American people.

W. E. Mallalieu, director of the National Board of Fire Underwriters, 85 John Street, New York City, is in charge of the campaign and will answer all requests for information on fire prevention and fire control from those cooperating in this vital national defense program.

Personal AND OTHERWISE

Laclede Promotions

JOHN J. NEEDHAM, former auditor of The Laclede Gas Light Company, St. Louis, Mo., has been elected secretary-treasurer of the company, succeeding E. L. White, who was recently elected vice-president.

Mr. Needham joined the company as a clerk in 1905.

Martin McVey, former assistant secretary, has been appointed auditor, succeeding Needham. He joined the Laclede forces in 1904 as a messenger boy. He will retain his position as assistant secretary.

Spiner Leaves Utility

L. H. SPINER, executive assistant to L. Wade Childress, president of The Laclede Gas Company, St. Louis, has resigned from that position to re-enter the advertising, merchandising and public relations field.

Spiner went to Laclede in October, 1938, from the Shell Oil Company where he was director of advertising, merchandising, and publicity.

New Louisiana Posts

ELECTION of R. M. Salvant as vice-president and secretary of the Louisiana Power & Light Company was announced April 15 by W. O. Turner, president, following a meeting of the board of directors in New Orleans.

At the same time, the election of A. M. Naquin as assistant treasurer became effective.

Both Mr. Salvant and Mr. Naquin have long service records with their company. Mr. Salvant has been with the present company and its predecessor organizations since October 1, 1911. Mr. Naquin began as a clerk with the New Orleans Public Service, Inc. in June, 1924, but joined the Louisiana Power & Light Company as general bookkeeper in November, 1927.

"Believe It or Not" Turns to Gas

MILLIONS of newspaper readers from coast to coast learned recently of the outstanding meter reading performance of George P. Woll, of The Brooklyn Union Gas Company, when Robert Ripley featured his record in a Believe It or Not cartoon. In the past ten years, Mr. Woll has taken 824,880 perfect readings with no errors. Mr. Ripley included a sketch of Mr. Woll reading a gas meter.

Frank W. Humphreys Dies

FRANK W. HUMPHREYS, for the past 11 years employed by the Brooklyn Borough Gas Company as wholesale representative, died at his home in Teaneck, N. J., on March 19 after a three-day illness. He is survived by his widow and son, John.

Mr. Humphreys was the brother of the late J. J. Humphreys, general manager of Brooklyn Borough Gas Company until 1910 and former Mayor of Coney Island. He was widely known in utility, building and real estate circles as a great constructive salesman who performed splendid service both to his company and to the builders of Brooklyn. He had spent his entire business career in the gas industry.

At a dinner-meeting held at the William Penn Hotel in Pittsburgh, on March 10, sales representatives of CP gas range manufacturers, together with gas company officials, enthusiastically endorsed the April "On to Freedom" gas range campaign sponsored by the Gas Appliance Promotion Division

Rose Quits Utility Posts To Take Up Army Duties

RETIREMENT of Brig. Gen. Edward C. Rose as a director and vice-president of the Public Service Corporation's three subsidiary companies because of Army duties was announced April 21 at the annual meeting of the corporation's stockholders.

Although retiring from Public Service Electric & Gas Co., Public Service Coordinated Transport Co., and Public Service Interstate Transportation Co., Gen. Rose will remain as director and vice-president of the corporation. He was called to duty with the 44th Division at Fort Dix last fall and was given an indefinite leave of absence by the corporation.

Thomas N. McCarter, chairman of the corporation, announced election of six new directors to the board. They were:

Robert A. Zachary, vice-president; Thomas N. McCarter Jr., vice-president in charge of the Southern division; T. Wilson Van Middlesworth, treasurer; Lyle McDonald, comptroller; Franklin Heydecke, general auditor, and Marion Penn, general manager of the electrical department.

Concealed Radiant Heating Described in Booklet

CONCEALED radiant heating, employing pipe coils laid beneath floors to distribute heat evenly throughout the room and supplied with steam, hot water or vapor steam from a central heating plant, is the subject of a booklet just published by A. M. Byers Company, Pittsburgh, Pa.

The importance of controlled heat in such a system makes it particularly adaptable for the use of gas as fuel.

The booklet describes the history, principles and advantages of concealed radiant heating, gives comparative costs, describes and illustrates the design of installations, answers the more pertinent questions concerning the system and gives a bibliography of reference material.

Copies of the booklet may be obtained free from A. M. Byers Company, Pittsburgh.

Bright Young Lady

NATURAL gas men in the Texas Panhandle still tell about the young lady from the East with two college degrees who stopped in Amarillo for the first time. She asked the hotel clerk what there was of interest in Amarillo. He replied that the city had the only helium plant in the world. "Really?" she remarked. "Is it in bloom now?"

—Public Utilities Fortnightly.

Converting Electric Ranges to Gas

DUE to the difficulty in securing shipments of gas appliances to the West Indies under war conditions, the Barbados Gas Company found itself with only one up-to-date gas range left in its showrooms.

Full of resources, the company turned to electric ranges and converted them into gas. The difficulty of control of fresh air to the oven was overcome and the customers now have these appliances available at what is said to be a reasonable cost with a guarantee of full allowance toward the new gas ranges when they arrive.

In other cases electric ranges have been broken up to provide spare nuts, bolts, etc. and the side sheets of the electric range are used to patch holders and make useful oven browning shelves until the gas ranges come in.

Seattle Gas Appoints New Vice-Presidents

TO improve service for household and commercial customers and meet the increased needs created by Seattle's rapid expansion and by new defense industry requirements, James F. Pollard, president of the Seattle Gas Co., has announced the creation of two operating vice-presidencies. The posts were filled at the March meeting of the board of directors.

By the appointments, made to strengthen the company's technical staff, General Superintendent George R. Horning is promoted to the position of vice-president in charge of engineering and distribution, and George R. Steere, becomes vice-president in charge of production.

Mr. Steere comes from Portland, Maine, where he has been assistant manager of Portland Gas Light Co. in charge of production for the last three years. His Portland affiliation was preceded by more than 20 years' engineering, research, and industrial management positions for some of the largest gas industry and engineering firms in the country.

Southern California Gas Elects New Directors

GUY W. WADSWORTH, JR., was elected vice-president in charge of employee relations of the Southern California Gas Company at a meeting of directors on April 16. Mr. Wadsworth and E. N. Simmons, controller of the company, were elected to the board of directors at the annual stockholders' meeting, filling two vacancies on the board. This announcement was made by F. S. Wade, president. Other officers and directors were re-elected.

Mr. Wadsworth, personnel manager of the company and the Southern Counties Gas Company, has been identified with the gas industry in southern California since 1921. He became personnel manager of the Southern California Gas Company in the spring of 1937.

Mr. Wadsworth has been a member of the Los Angeles Civil Service Commission since 1938, and was recently named chairman of the Subcommittee on Personnel Problems on Governor Olson's Defense Council. He is a member of the Committee on Personnel Practices of the American Gas Association.

Mr. Simmons, controller of the Southern California Gas Company since 1937, entered the employ of the former Los Angeles Gas and Electric Corporation in 1909 in the auditing department. He became assistant auditor in 1922 and general auditor in 1925.

Mr. Simmons has been active in accounting sections of the American Gas Association and Pacific Coast Gas Association, and is a member of the Management Committee of the Accounting Section of the A. G. A., and past chairman of the Accounting Section of the P. C. G. A. He is a member of the Controllers Institute of America, and several local civic organizations.

Coffee Spoon Offer Plus Employee Cooperation Sells 1070 Ranges

E. J. Boyer

DURING January and February, the Minneapolis Gas Light Company conducted a unique mid-winter gas range sale with highly successful results. Known as the Fourth Annual Employees Mid-Winter Gas Range Sale and supported by all 900 employees of the company, the campaign resulted in the sale of 1070 gas ranges, of which approximately one-third were CP models. During this time, 70 electric ranges were replaced and the number of new electric range installations decreased considerably.

The wholehearted cooperation of the employees in this campaign brought in 1,361 leads which resulted in 311 sales. The range manufacturer also cooperated by making it possible for the company to offer three ranges, one of which was a CP model, at unusual prices.

Almost every advertising medium was used during the drive; 7522 lines of newspaper ads were run in the large daily newspapers in Minneapolis, and radio programs were broadcast three days a week for the eight-week period. An effective feature of the campaign was the distribution of 100,000 doorknob hangers, such as that illustrated herewith, and 200,000 return postcard inserts which were sent out with the gas bills.

The inserts and doorknob hangers proved to be among the most profitable items of advertising used throughout the 60-day campaign, according to E. J. Boyer, sales manager of the company. These pieces encouraged the customer to ask for information about the range by offering a coffee measuring spoon free of charge. The surprising appeal of this offer brought 2,656 requests for spoons. Mr. Boyer indicated that the coffee spoon idea was so successful that it would be used again in the future.

Mr. Boyer pointed out that "while our advertising emphasized a standard range, it was our practice to build up the customer to a CP model whenever possible and this was done with considerable success as the final results indicate."

"The idea of a mid-winter sale at the time of year when such an activity would be considered difficult, has become a fixed policy of this company and, undoubtedly, will be continued in future years," he said. "In this way we are able to bridge the slack between Christmas and early Spring and keep our shop and sales departments busy."

OVER
OVER
From Your GAS MAN!
I am sure you will be interested in the special reduced prices on beautiful new A-B Gas Ranges during our Annual Midwinter Sale. For full details on special offers and sale prices, send attached postpaid card. We will also send you free of charge the handy coffee measuring cup illustrated. No obligation.
A HANDY COFFEE MEASURING SPOON THAT DOESN'T SPILL
FILL OUT AND MAIL ATTACHED CARD today

Top half of doorknob hanger, one of the most effective pieces of advertising in the mid-winter gas range sale

Retired Natural Gas Leader Dies

Frank L. Chase

FRANK L. CHASE, retired vice-president of Lone Star Gas Company, Dallas, Texas, one of the "grand old men" of the natural gas industry, died on a train near Memphis, Tenn., on April 2. He had been a pioneering leader of the industry for 38 years at the time of his retirement on June 1, 1939, and for 22 years was an official of the Lone Star company.

A graduate of Massachusetts Institute of Technology, Mr. Chase entered the employ of the New York Central Railway, and as engineer of structure for the line built most of its bridges from New York to Chicago. He entered the gas business in 1900 in executive charge of eight companies which served Dayton, Springfield, and towns in the Miami Valley of Ohio. In 1917 he went to Lone Star Gas Company, and his engineering skill and broad gas experience were vital factors in helping the struggling Texas gas company locate additional gas supplies.

Mr. Chase played a major role in developing Community Natural Gas Company, the distribution company which pioneered in bringing natural gas to small, widely scattered communities in Texas and Oklahoma. During his presidency of this Lone Star subsidiary, the company grew from serving less than 50 towns in 1925 to more than 300 towns at present.

Under his supervision the gas measurement department of Lone Star was organized. As operating manager, for twenty-two years he had direct supervision of the company's production, pipe lines, compressor stations, gasoline plants and telephone system.

Mr. Chase had rendered extensive service to the gas industry, having served as director of the former Natural Gas Association of America, chairman of the natural gas department of the American Gas Association, and member of management, executive and technical committees of the Association. For many years he was active in every southwestern association dealing with oil and gas.

In 1935 he was appointed to the newly formed Federal commission designated as the advisory board of the United States Bureau of Mines. In March, 1939, he was named a member of the American Petroleum Institute's central committee on measuring, sampling, and testing natural gas and natural gasoline.

CONVENTION CALENDAR

MAY

April 29-May 1 U. S. Chamber of Commerce
Washington, D. C.

May 2-3 Pennsylvania Natural Gas Men's Association, Petroleum & Natural Gas Conference
Pennsylvania State College

5-6 American Management Association Insurance Conference
Hotel Astor, New York, N. Y.

5-7 A. G. A. Natural Gas Section Convention
Adolphus and Baker Hotels, Dallas, Texas.

8-9 National Metal Trades Association
Palmer House, Chicago, Ill.

12 National Fire Protection Association
Toronto, Ont.

12-14 Pennsylvania Gas Association
Skytop, Pa.

19-21 A. G. A. Production and Chemical Conference
Hotel Pennsylvania, New York, N. Y.

20-21 Canadian Gas Association
Royal Connaught Hotel, Hamilton, Ontario.

22-23 Natural Gas and Petroleum Association of Canada
Hamilton, Ontario.

26-29 National Association of Purchasing Agents
Chicago, Ill.

JUNE

June 2-5 Edison Electric Institute
Buffalo, New York.

3-5 Association of Gas Appliance & Equipment Manufacturers
Ambassador Hotel, Los Angeles, Calif.

9-10 Pacific Coast Gas Association Northwest Conference
Portland, Ore.

16-20 American Society of Mechanical Engineers—Semi-Annual Meeting
Kansas City, Mo.

30-July 1-2 Michigan Gas Association,
Grand Hotel, Mackinac Island, Mich.

SEPTEMBER

Sept. 8-10 Mid-West Gas School and Conference
Ames, Iowa.

10-12 Pacific Coast Gas Association Annual Convention
Del Monte, Calif.

week of 28 American Transit Association
Chalfonte-Haddon Hall, Atlantic City.

OCTOBER

Oct. 6-10 National Safety Congress and Exposition
Stevens Hotel, Chicago, Ill.

week of 20 A. G. A. Annual Convention
Atlantic City, N. J.

Thuerk Elected President of Bradford Electric

Hugh C. Thuerk

HUGH C. THUERK, formerly a member of the staff of the Atlantic Utility Service Corporation, New York, was elected president of the Bradford Electric Company on April 15. He succeeds B. M. Kirsch who was appointed executive vice-president of the Erie Lighting Company and vice-president of the Pennsylvania Electric Company.

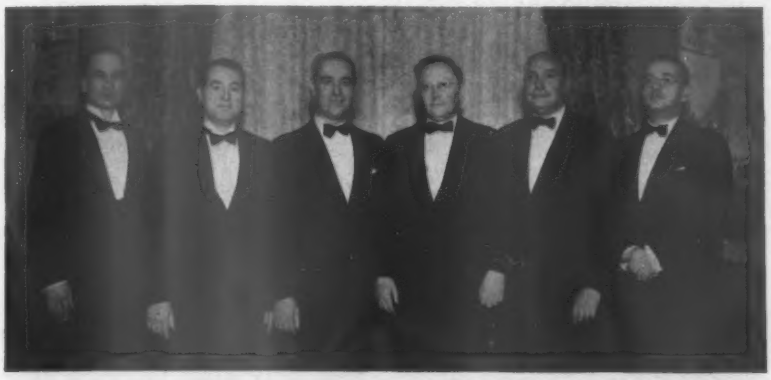
Since his graduation from Purdue University, Mr. Thuerk has had wide experience in public utility affairs in the commercial, industrial sales and engineering branches of the business. He has been an active member of the American Gas Association and, for the past two years, has served as chairman of Association's Community Development Committee which was organized under his direction. For the past year this committee has sponsored a series of articles in the A. G. A. MONTHLY describing community activities of various gas companies. Mr. Thuerk will continue as chairman of this group until the end of the fiscal year.

In addition to the A. G. A., Mr. Thuerk is a member of the American Society of Mechanical Engineers.

K. C. Krick Is Dead

K. C. KRICK, formerly vice-president of the Ohio Fuel Gas Company, Columbus, Ohio, died at his home on March 19. During his active business life, Mr. Krick played an important part in the progress of the gas industry in Ohio, where he was an organizer and for many years director of the Ohio Gas & Oil Men's Association. He was also an important factor in the national field, and as president of the old Natural Gas Association of America contributed much to the industry's advancement.

AFFILIATED ASSOCIATION *Activities*



Officers of the New England Gas Association elected March 27 in Boston. Left to right: Clark Belden, executive secretary, Boston; Earl H. Eacker, treasurer, Boston; Charles G. Young, president, Springfield; John A. Weiser, retiring president, Newport; John West, first vice-president, Boston; Norman B. Bertolette, second vice-president, Hartford

New England Gas Association

CONTINUING a parade of record-breaking conventions, the fifteenth annual business conference of the New England Gas Association in Boston, March 27 and 28 not only attracted 632 registered delegates but brought out a wealth of valuable information. An outstanding feature of the conference was the gas appliance and equipment exhibit in which 40 manufacturers displayed a wide variety of equipment.

Charles G. Young, manager of the Springfield Gas Light Company, was elected president of the Association for the 1941-1942 term. Other new officers elected at the convention are: first vice-president—John West, regional executive, New England Power Service Co., Boston; second vice-president—Norman B. Bertolette, president, The Hartford Gas Co.; treasurer—Earl H. Eacker, assistant to president, Boston Consolidated Gas Co.; clerk—Clark Belden, executive secretary, The New England Gas Association.

Division chairmen elected for the new term are: *Accounting*—John H. Allison, Cambridge Gas Light Co.; *Industrial*—Walter D. McCrea, Cambridge Gas Light Co.; *Manufacturers*—George P. Velte, American Stove Co.; *Operating*—Charles P. Warner, Manchester Gas Co.; *Sales*—Ronald A. Malony, The Bridgeport Gas Light Co.

In addition to announcements of sales contest and best paper awards, the opening general session, Thursday morning, was devoted to regional and national association activities. The work of the New England Gas Association was outlined by John A. Weiser, retiring president, and Clark Belden, executive secretary. Major Thomas J. Strickler and Major Alexander Forward, president and managing director, respectively, represented the American Gas Association on this program. Part of Major Strickler's forthright address was published in the April issue of the MONTHLY.

The manufacturers' viewpoint was presented by Watson E. Derwent, president, Association of Gas Appliance and Equipment Manufacturers, who expressed concern over the problems created by the national defense program. To give some idea of the magnitude of the appliance end of the gas industry, Mr. Derwent stated that it represents approximately three times the total net revenue of all manufactured and mixed gas properties in the United States.

Accounting, technical, home service, and sales developments were covered in full at other meetings Thursday and Friday. The five-star feature dinner Thursday evening which presented a panel discussion on advertising and sales promotion by five outstanding advertising executives was a hit of the convention.

Reports and papers presented at the convention will be published in full in the *New England Gas News*.

Pennsylvania Gas Association

THE thirty-third annual meeting of the Pennsylvania Gas Association to be held at Skytop Lodge on May 12, 13 and 14, will feature fact-finding sessions of vital interest to the gas industry. "Deeds First, Then Words," the title of an address to be delivered Monday evening by Major Thomas J. Strickler, president of the American Gas Association, might well be the theme of the entire convention. The two evening and three morning sessions will be filled with accounts of practical operating men who are authorities in their respective fields.

In addition to Major Strickler's talk, the Monday evening program, May 12, will feature an address on "False Values" by John F. Davis, of Reading, Pa. Business sessions Tuesday and Wednesday are sponsored by the following committees: Distribution, Accounting, Production, Customer and Employee Relations, and New Business.

"Some Thoughts on Meter Economics" by A. W. Johnson, The Hartford Gas Company, will open the first business meeting. Other speakers and their subjects will be: George B. Webber, Public Service Corp. of New Jersey, "Evaluation of a Training Program"; Dr. R. B. Mitchell, University of Pennsylvania, "Modern Trends in Financial Statements—Their Effect on Financial Analysis"; J. Edward Brewer, Brewer and Gardner, "Developments in Dry Box Purification," and E. J. H. Flexer, Allentown-Bethlehem Gas Co., on an accounting practice.

Major Alexander Forward, A. G. A. managing director, and James E. Gheen of New York, are the principal speakers for the second evening session, Tuesday.

W. G. Murfit, The Philadelphia Gas Works Co., leads off the second business meeting, Wednesday, with a paper sponsored by the Customer and Employee Relations Committee. Other headliners at this session will be: Louis F. Demmler, Ketchum, MacLeod & Grove, Inc., "Here's How in Pittsburgh"; Lyle C. Harvey, president, Bryant Heater Co., "How To Get Fat"; and George S. Jones, Jr., vice-president and general sales manager, Servel, Inc., "Refrigeration and the Gas Utility Management."

Canadian Gas Association

PROBLEMS of mutual interest to the American and Canadian gas industries will be discussed at the thirty-fourth annual convention of the Canadian Gas Association in Hamilton, Ontario, May 20 and 21. Authoritative speakers from both countries will take part in a program of significant and timely topics. Special care has been taken by J. B. Von Maur, papers committee chairman, to allow sufficient time on

the program for informal discussions of subjects of local and national concern.

Thomas J. Strickler, president of the American Gas Association, will make one of the principal addresses at the convention. Other speakers and their subjects announced so far include: A. J. Strain, Consumers Gas Company of Toronto, "Water Heating in Reverse"; M. J. Gardner, Montreal Light, Heat & Power Cons., "Gas in Industry"; A. E. Lee, Servel, Inc., "Mass Production for Appliance Sales"; H. P. Nagel, "Know Ourselves—and Our Customers Will Know Us Better," and John Keillor, B. C. Electric Ry. Co., Ltd., on the need for a change in present gas standards in Canada.

George L. Scofield, Dominion-Republic Companies, Buffalo, N. Y., and chairman, A. G. A. Domestic Range Committee, will conduct a symposium designed to emphasize the importance of home service work to the up-to-date gas company. Jessie McQueen, A. G. A. home service counsellor, and others will take part in this feature.

Attractive entertainment functions and an annual dinner on the evening of May 21 will round out the program.

The following two days, May 22 and 23, will be taken up with the convention of the Natural Gas & Petroleum Association of Canada at which a number of prominent gas men will speak.

Oklahoma Utilities Association

MORE than 500 persons attended the twenty-third annual convention of the Oklahoma Utilities Association at the Mayo Hotel, Tulsa, Okla., on March 17 and 18. Lead by R. K. Lane, president, Public Service Co. of Oklahoma, and president of the Association, an instructive program of timely subjects was presented.

O. A. Kinzer, utilization engineer, Dallas Gas Company, suggested many ways in which new technical equipment could be used to increase the company load and at the same time have better satisfied customers. Some practical pointers on "How To Stay Out of Court" were contributed by Paul Pinson, attorney for the Oklahoma Natural Gas Company.

A highlight of the meeting was an address by P. McDonald Biddison, consulting engineer of Dallas, on "Natural Gas, Electric Power and Washington." Mr. Biddison told an enthusiastic audience that certain government agencies had taken over duties and jurisdiction formerly considered to be that of the courts.

W. H. Carson, dean of the college of engineering, University of Oklahoma, presented a report on the annual Gas Meter School which told of the growth of this 17-year-old activity.

Other speakers were: Dr. A. Linscheid, president, East Central State College; C. M. Ripley, General Electric Co.; Richard L. Jones, Jr., vice-president and general manager, Tulsa Tribune; and Judge Oras A. Shaw, Tulsa, who spoke on the advancement of chemurgy in Oklahoma.

The convention dinner with W. L. Woodward, president, Zenith Gas System, Inc., Alva, acting as toastmaster, was a notable success.

Speakers Announced for A.G.A.E.M. Meeting

W. E. Derwent

ACCORDING to R. G. Logue, program chairman for the forthcoming annual convention of the Association of Gas Appliance and Equipment Manufacturers which is to be held at the Ambassador Hotel, Los Angeles, June 3-5, the speakers at the general session of the convention to be held on Wednesday morning, June 4, will include Fletcher Bowron, Mayor of Los Angeles; W. E. Derwent, president, A.G.A.E.M.; R. A. Hornby, president, Pacific Coast Gas Association; W. R. Smith, general chairman, P.C.G.A. Manufacturers Section; Geo. H. Green, president, National Retail Hardware Association; and Deke Houlgate, special representative, American Gas Association.

The general schedule of events for the convention calls for divisional meetings on Tuesday, June 3, while Thursday, June 5, has been set aside for a meeting of A. G. A. E. M. directors. The President's Dinner will be held the evening of June 5. Attractive entertainment features planned for the convention include: a golf tournament, Cocoanut Grove Party, Tour of Hollywood and Beverly Hills, and a trip to Catalina Island.

Fair Trade Code for Gas Range Manufacturers

IN recognition of the changes in economic and business trends, the Fair Trade Practices Committee of the Association of Gas Appliance and Equipment Manufacturers' Domestic Gas Range Division, last year surveyed the industry and invited suggestions for any modifications to the "Statement of Business Practices for Manufacturers of Gas Ranges," to supplement the survey made several years ago.

After reviewing all the suggestions that were made, the division approved certain amendments to the Practices and the revised code is now available to manufacturers. The committee strongly recommended that copies of these practices also be made available to all sales personnel in the gas range industry, and for that purpose the Association can furnish manufacturers with as many copies as required.

The members of the Fair Trade Practices Committee are: Chairman, W. Frank Roberts, president, Standard Gas Equipment Corp.; W. L. Cooper, vice-president, Florence Stove Co.; C. H. Hoffstetter, president, Odin Stove Manufacturing Co.; Malcolm Leach, sales manager, Glenwood Range Co.; and C. R. Ohnimous, vice-president, Hammer Bray Co., Ltd.

Wisconsin Utilities Association

O. W. Barenscher
Chairman, Technical Division

TACKLING vital operating and sales problems of the Wisconsin gas industry, more than 350 delegates took part in the annual convention of the Gas Section March 17 and 18 at the Wisconsin Hotel, Milwaukee. Nationally recognized speakers as well as local authorities contributed to an outstanding program.

A. P. Gale, executive vice-president, Wisconsin Power & Light Co., and president of the Wisconsin Utilities Association, presided throughout the meeting. In his presidential address, Mr. Gale emphasized the alarming increase in utility taxes, pointing out that Wisconsin utilities paid an average of 17 per cent of their gross revenues to governmental agencies. He stated that gas output in the state increased nearly 7 per cent over the previous year.

Among the principal speakers was Thomas J. Strickler, president of the American Gas Association, whose address was reproduced in part in the last issue of the MONTHLY. Representatives of the association on the A. G. A. managing committees reported on national activities at the joint session of the commercial and technical divisions.

Absorbing round-table conferences featured the separate convention sessions of the technical division. O. W. Barenscher, Wisconsin Public Service Corp., Sheboygan, was elected chairman of the division, succeeding H. E. Sweet. E. C. Hemes, Milwaukee Gas Light Co., was elected vice-chairman.

More than 200 delegates attended the separate session of the commercial division. C. A. Debell, Wisconsin Public Service Corp., Sheboygan, was elected chairman of the division, succeeding Paul DeLeon. John G. Felton, Northern States Power Co., La Crosse, was elected vice-chairman.

Joint A. G. A. - E. E. I. Conference in Cincinnati Makes Notable Accounting Contributions

By W. G. MURFIT*

The Philadelphia Gas Works Co., Philadelphia, Pa.

THE Joint Accounting Conference of the American Gas Association and the Edison Electric Institute held at the Netherland-Plaza Hotel, Cincinnati, April 6 to April 9 was a great success for several reasons:—

1. Because E. N. Keller, Philadelphia Electric Company, Chairman of the American Gas Association Accounting Section, and G. H. Bourne, Commonwealth and Southern Corporation, the head of the Edison Electric Institute Accounting Committees, were Co-Chairmen and directed the scope of the conference.

2. Because J. A. Williams, of Niagara Hudson Power Corporation, and L. A. Mayo of The Connecticut Light & Power Company, representing the A. G. A. and the E. E. I. respectively, were the coordinators who, with a group of able assistants, effected a program that was of vital concern to all elements in the accounting field.

3. Because Cincinnati was wisely chosen as the place of meeting. Its central location and its adequate hotel accommodations received hearty endorsement from all who attended. There were 431 registered from 98 companies; and they came from Boston and Los Angeles; from New Orleans and Sheboygan; and from points between.

GENERAL SESSION

The session was opened by G. H. Bourne with a few words of greeting. He then introduced Hubert C. Blackwell, president of The Cincinnati Gas & Electric Company, who welcomed the members to Cincinnati. Mr. Blackwell described his company and its position in the community, and he invited all present to inspect it thoroughly.

Charles W. Kellogg, president of the Edison Electric Institute and chief of the Advisory Committee on Power of the Federal Office of Production Management, was the next speaker. Mr. Kellogg discussed the relationship between government regulation and utility operation and the adequacy of installed electric generation capacity to meet National Defense needs. He examined briefly policies of charging depreciation and related these to the rules thereon that have been made effective by State regulatory authorities.

Next Major Thomas J. Strickler, president of the American Gas Association, stated that the gas industry welcomes its share of the opportunity to contribute to National Defense as it is in a splendid condition to serve adequately. He discussed methods of plant protection against damage from without as well as from within and informed members that the A. G. A. has available valuable information on defense measures, some of which has been gleaned from recent experiences of foreign companies.

J. Arthur Marvin, partner of F. W. Lafrentz & Company, certified public accountants, spoke on "Internal Check, Audit and Control." He asserted that accounting is "management's right arm" and therefore, good accounting methods relieve management of many operating problems, and thus free it to concentrate on production and distribution problems related to national defense.

"Gas and Electric Utilities and the Wage and Hour Law" was the subject of a discussion by Baird Snyder, deputy administrator, Wage and Hour Division of the United States Department of Labor. He outlined many conditions that might arise in industry and then applied the Wage and Hour Law to them. He defined the requirements and specifications of employees' jobs which decide whether they are subject to the Act or not.

The session was closed by E. N. Keller, Chairman of the A. G. A. Accounting Section.

CREDIT AND COLLECTION

In the absence of William D. Dyer, Boston Edison Company, Boston, Mass., the Credit and Collection Conference on Monday, April 7, was opened by Co-Chairman, Harold F. Quad, Public Service Electric & Gas Company, Newark, N. J., who from time to time commented on the papers under discussion. These were as follows: "Geographic Weighting of Customers by Paying Habit" which was introduced by E. F. Albert of the Philadelphia Gas Works Company and evoked a spirited discussion by several of the delegates.

W. A. Kelley of Consolidated Elec. Lt. & P. Co. of Baltimore, discussed "Current Events, Their Effect on Credit and Collections" in an informative manner. "Credit Approval of Service Applications" was introduced by T. H. Million, Philadelphia Electric Company, who outlined credit qualifications and the guarantee deposit policy of that company.

R. E. Boyle of Dayton Power & Light discussed the "Relations between Credit Standing and Shut-off Action." The conference was well attended and the delegates were keenly interested.

A Credit and Collection Luncheon Conference Tuesday, April 8, was attended by 40 accounting and collection delegates who participated in the proceedings in a spontaneous and informative manner. The conference started under the chairmanship of Edward A. Driscoll, Public Service Electric & Gas Company of Newark.

Harold A. Quad started the ball rolling by a discussion of the "Classification of Customers by Paying Habits." He was followed by a presentation on "Educating and Training Collection Representatives" which was very well rendered by another representative of the Public Service Electric & Gas Company. Measures of Collection Efficiency was opened up by T. H. Million, Philadelphia Electric Company, who exhibited a number of collection statistical reports compiled by that company. The meeting was then thrown open for a general airing of new collection wrinkles and ended fully as profitable as the one of the preceding day.

CUSTOMER ACCOUNTING

The open meeting of the Customer Accounting Group was held on Monday afternoon under the joint leadership of Dewey C. Daubmeyer, The Detroit Edison Company and Daniel E. Maloney, The East Ohio Gas Company.

The meeting was opened by a paper prepared and read by William C. Israel of the Detroit Edison Company—"Sensing Marks on Tabulating Cards." The paper dealt with the new type of I. B. M. punch cards now in experimental use in that company for meter reading and billing operations. If the operation proves successful it is anticipated that meter reading books can be eliminated. Up to the present time the Detroit Edison Company is showing excellent progress.

Ohmer Ullery, Ohio Fuel Gas Company, gave a brief description of bill receipting

*Chairman, Accounting Section Editorial Committee.

machines used by tellers in his company, stressing their economic advantages.

John H. Roper, Washington Gas Light Company, led the discussion on night posting of cash and outlined the extent to which such a plan is in operation in his company citing the way in which employees are given permanent positions on the basis of proficiency in the night posting operation.

An open luncheon conference was held Tuesday noon. Wilbur R. Seidel, of Rochester Gas & Electric Corporation, was the leader. The subjects discussed were:

1. Procedures for applying most beneficial rates.
2. How can sales adjustments or allowances be reduced.
3. New methods that eliminate re-routing accounts.
4. Standards for comparing commercial accounting results.
5. New ideas—billing and accounting systems.

CUSTOMER RELATIONS

Harry Jeffs of Queens Borough Gas & Electric Company acted as chairman and Henry Flanegan of the Philadelphia Electric Company as co-chairman of the Customer Relations Group Meeting on Monday afternoon. Mr. Flanegan opened the meeting with an analysis of types of personnel engaged in Customer Contact work and the effect that current events will have on employment and retention of persons adaptable to this work. E. T. Colton, of New Orleans Public Service Inc., explained a rearrangement of work in his company present declared the meeting to have been a most interesting and helpful one.

An open luncheon conference was held at 12:30 Tuesday. Walter R. Keagy, of The Cincinnati Gas & Electric Company, was the Discussion Leader. The subjects discussed were:

1. Are women employees to be preferred to men on contact work?
2. Control of procedures for handling complaints—mail or in field.
3. Practice of allowing customers to settle their own complaints.
4. Specialization versus generalization in performing service work.

CUSTOMERS' ACTIVITIES

John A. Williams, of Niagara Hudson Power Company, and Leo A. Mayo, of The Connecticut Light & Power Company, conducted this informal joint session which was attended by Credit and Collection, Customer Accounting and Customer Relations groups.

J. Gordon Ross of Rochester Gas & Electric Corporation, in his paper, "Collecting Money and Good Will" convinced his audience that these two activities are not hostile. Through adequate credit information, the foundation for any subsequent collection activity is established and courteous but persistent treatment, based on accurate history records, will obtain payments and retain good will.

George Saas, director of public relations of the Citizens Gas and Coke Utility, Indianapolis, in his paper, "What Features of a Utility's Service Are Considered Arbitrary by Customers? Remedy!" to the surprise of his audience showed that rates cause but 5% of customer dissatisfaction and that company thoughtfulness as exemplified in rules of practice and employee courtesy cause practically half the dissatisfaction. His paper aroused much enthusiasm and his closing words, "Companies must make a noise like a moose," was an epigram that will long be remembered. The paper will be printed in the next issue of the MONTHLY.

G. W. Fuchs, of Philadelphia Electric Company, informally discussed some of the high points of customer accounting in his informative paper "Proofs Employed and Statistics Computed in Service Billing Operations." His paper described methods employed in proving the accuracy of service billing and the accumulation of statistics obtained as a by-product of such operations.

Harold F. Quad, of Public Service Electric & Gas Company, stated in his paper "The Relation of Residential Deposits to Uncollectible Accounts," that deposits have been regarded as "uncollectible bill insurance." His analysis of the advantages and disadvantages of a general policy of taking deposits is worth careful study.

GENERAL ACCOUNTING

An open meeting was held by this group with Otis H. Ritenour of Washington Gas Light Company and Alwyn M. Hartogensis of Ebasco Service, Inc., as co-chairmen.

The paper by Kenneth C. Long, vice-president, Dayton Power & Light Company, "Budgetary Control—A Method of Management" pointed out in a splendid manner that it was not an accident that there is no shortage of gas and electricity today. Long range planning of our industries was responsible for being ahead of the present heavy defense requirements.

If a Manual of Procedure is to be successful, it is necessary to call on the workers and supervisors to design and prepare it. This was the essence of a paper on this subject by Fred Seinecke, New York and

The Cincinnati Accounting Conference in session. Above is the Customer Accounting group while at right is the General Accounting crowd—both of which met simultaneously

which merged certain duties of tellers and contact clerks.

Companies' policies and practices at the contact desks were discussed and a trend to take more and more of customers' statements without verification, was discovered. Form letters, and the necessity of an annual review of them, were then discussed. On adjournment the thirty or more members

Queens Electric Light & Power Company.

"Internal Audits," a paper by John G. Ivers, The Detroit Edison Company, was presented in a most interesting manner and developed to indicate that a proper internal audit system could be the eyes and ears of management.

In the paper by Frank Clark, Kansas City Power & Light Co., there were recited experiences with Federal and State regulatory commissions and suggestions were made as to procedures to be followed.

A closed luncheon conference was held Tuesday noon. Richard B. Curran of The Connecticut Power Company was the Discussion Leader. The subjects discussed were:

1. Centralization versus decentralization of payroll, stores, and other general accounting.
2. On what basis should the non-productive time of hourly wage employees be allocated?
3. The scope and use of a work order system for operations and maintenance.

DEPRECIATION

An open meeting Monday afternoon was conducted by Herman L. Gruen, Consolidated Gas Electric Light & Power Company, and Harry C. Hasbrouck, Atlantic Utility Service Company, New York, as co-chairmen. The meeting was particularly fortunate in having a paper by Samuel Ferguson, president of The Hartford Electric Light Company, discussing the relation of the interest factor to the proper handling of the depreciation problem, a presentation which elicited considerable interest and discussion. The active participation of this leading executive is significant of the importance of this difficult problem which has defied satisfactory solution over a period of many years. An actual approach "On Straight Line Depreciation," where theory was illustrated by algebraic formulae, was presented although it pointed out the difficulty in estimating the life of property. The paper was prepared by Maurice R. Scharff, a consulting engineer from New York.

Bernard S. Rodey, Jr. and Malcolm J. Gonzalez, of Consolidated Edison Company of New York had prepared, but Alan Mitchell presented, a discussion of the Annual Rate Method of Charging Depreciation. Charts and graphs illustrated the theory.

Messrs. Hasbrouck and Gruen also presided at a closed luncheon conference of the Depreciation Group on Tuesday noon. This meeting permitted informal discussion of the committee's program for analyzing the depreciation problem with particular reference to the furtherance of cooperation with the Depreciation Committees of the National Association of Railroad and Utilities Commissioners.

INSURANCE

An open meeting was held on this subject Monday afternoon at 2:00 P.M. Joseph H. Nickell, Philadelphia Electric Company, and Reginald Fleming, The Commonwealth & Southern Corp., New York were co-chairmen. It was announced that the Gas Rating Schedule had been reviewed by the Central Lighting & Traction Bureau; also that the National Fire Protection Association had been asked to reclassify their listing of electrical fires.

Next was discussed the Model Electrical Law proposed by the N.F.P.A. and then the Standard Purchase Contract used by boiler manufacturers. Other subjects reviewed were: Methods of Arriving at Values for Insurance Purposes; Riot, Civil Commotions, Explosion and Malicious Mischief Insurance, and also Turbine and Machinery Insurance.

MATERIALS AND SUPPLIES COMMITTEE

Vice-Chairman Carl H. zurNieden, Philadelphia Electric Company, presided at the Monday conference; K. C. Campbell of Detroit Edison acted as secretary.

Edward S. Brock, Public Service Electric & Gas Company, Newark, N. J., in his paper "The Materials & Supplies Investment," discussed the current trend of not storing for minimum stock due to difficulty in procuring materials. As a result, investments in storeroom supplies are increasing. John Krohn of Consolidated Edison, who read a paper, "Accounting for Reels, Drums and Containers" described methods by which a number of companies carry these containers in their stock accounts until returned for credit.

Mr. zurNieden read a "Summary of Replies to Questionnaire Relative to Stores Procedures" which had been compiled by representatives of The Northern States Power Company. The data showed costs of Purchasing Expense and of Stores Expense as experienced by a number of companies.

The conference was well attended and progress from paper to paper was only possible by curtailing discussions.

Vice-Chairman zurNieden, who also presided at the Tuesday conference of this group, presented a paper, "Inactive Non-Standard Materials, Their Source, Disposition and Prevention." He pointed out that inactive materials, not obsolete, are of distinct benefit as they are in effect insurance for repairs or replacements. Their disposal will attend charging them off to operations when their constituent equipment becomes obsolete. Prevention is effected at the source by a system of normal orders and follow-up of obsolesence.

"Maintaining Purchasing Department Price Records," a paper by Robert H. Celander of Consolidated Edison Company, New York, discussed the methods in effect at the Consolidated Company for recording prices, sources and price trends.

This was followed by Mr. zurNieden reporting on "Purchasing Department Commodity Source and Price Records" as disclosed by a survey of 14 companies. Apparently most of them depend for checking the bills upon including prices on their purchasing orders.

PLANT RECORDS

This group held a closed luncheon meeting for members only, at 12:30 Monday. In the afternoon there was a general meeting at which H. B. Hardwick, The Commonwealth & Southern Corp., New York, and Edmund F. Wressell, Northern Indiana Public Service Company, were co-chairmen. Much of the session was devoted to a study of the plant accounting system of the Cincinnati Gas & Electric Company. This was followed by a general discussion of wide scope covering engineers' estimates, field reports, work in progress reports and finally property records.

Another meeting of this group was held Tuesday when Mr. Hardwick and Mr. Wressell were again co-chairmen.

Robert E. Dennis, Consolidated Edison Company of New York, had prepared a paper on the subject of checking inventories which was read.

TAXES

A closed meeting of this committee was held Monday afternoon. Robert M. Campbell, of Standard Oil Company of N. J. in New York, was chairman. The discussion of this important matter revolved around the following subjects:

Depletion Allowances—Percentage Depletion

Determination of Gross Income

a. Gas sold beyond the property line.

Determination of Net Income with particular reference to Interest, District General Expense, General Office Expenses, and State Income Taxes, especially the allocation of these charges where inventories are maintained.

A closed luncheon meeting of this group was held Tuesday noon. Robert M. Campbell presided. Maxwell E. McDowell, Standard Oil Company of N. J., New York, discussed the Federal Excess Profits Tax.

UNIFORM SYSTEM OF ACCOUNTS—NATURAL GAS

The members of the Natural Gas Committee on Classification of Accounts, in an informal closed meeting, discussed the problems of underground gas storage, capitalization of overheads, original costs of natural gas leaseholds and other accounting problems of interest to natural gas accountants. General approval was voiced of the West Virginia Commission's redefinition of original cost of natural gas leaseholds and it was agreed that similar action by the Federal Power Commission would be desirable.

LOCAL COMPANY INSPECTION TOURS

A great many who attended the convention remained until Wednesday when The Cincinnati Gas and Electric Company welcomed visitors at all their stations. Chief interest was shown in the company's Customer Contact and Accounting Systems in effect at the Central Office at 4th & Main Sts. All who visited the office were most favorably impressed by the courtesy of the personnel and the adequacy of the methods of operation.

The Development of Summer-Winter Hot Water from Central Heating Gas-Fired Boilers

By P. B. R. Baas

Brooklyn Borough Gas Company, Coney Island, N. Y.

WHETHER or not gas-fired house heating equipment should be sold with domestic hot water attachments is, I believe, quite a controversial subject, particularly in the manufactured gas industry today. Considerable doubt exists because comprehensive information concerning the operation of this type equipment has been, for the most part, meager and contradictory. Yet there appear to be only two really fundamental questions involved;

1. Is there any equipment now available that will perform efficiently enough to provide adequate and sufficient domestic hot water at an operating cost—throughout summer and winter—that would be in line with the operating costs for separate gas-designed water heaters?
2. Assuming that efficient and acceptable equipment for the purpose is available, what would the advantages be in selling this type of equipment?

Before embarking on a sales policy so radically different from previous practices, the management of any gas company would want to know within a fair degree of accuracy what could be expected from this type equipment.

200 Installations Sold

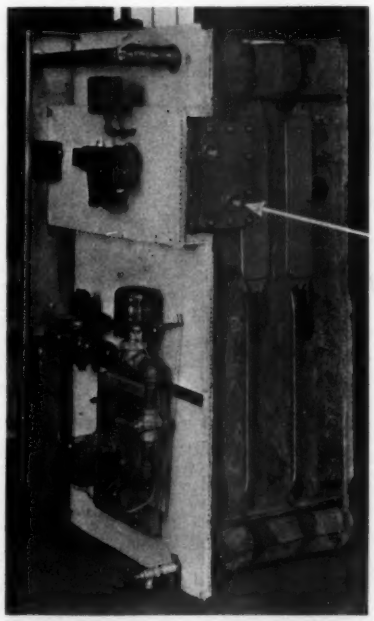
During the past eighteen months we have sold approximately 200 installations of this type and it is the purpose of this paper to present the results that we have obtained and to disclose the methods employed in obtaining them. The equipment and technique that we are using was developed through several years of careful research and experimentation.

About four years ago we became very much interested in the possibilities of one unit for house heating and water heating. We knew that our competitors were doing it and, incidentally, that they were taking a good portion of our water heating load from us. Some of our less scrupulous competitors were even telling our customers that they could obtain their domestic hot water for nothing during winter operation, so why not dispense with the gas water heater.

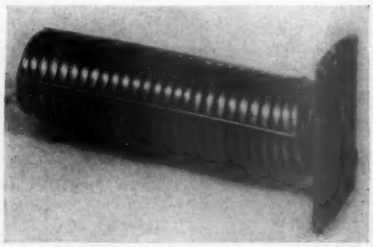
An investigation into the methods and equipment our competitors were using disclosed at once that their methods and equipment were too inefficient to be used with gas fuel. When the matter was taken up with manufacturers of gas-designed boilers they did not seem very much interested, especially those who were also manufacturing gas-designed water heaters. Discussion with men in the industry was not encouraging, chiefly because some of the existing equipment had been tried with very poor results. Our real encouragement came from Gebhardt Beck of Brooklyn Union, who has been a pioneer in this work and was experimenting with various types of equipment at that time. We received considerable encouragement and inspiration from him, as well as much valuable data which he very kindly made available for our use.

We were of the opinion that if a heating boiler were designed along sound engineering principles, it could produce domestic hot water economically without violating any of the established principles of physics—some expert opinion to the contrary notwithstanding. Our reasoning was that during winter operation the boiler, when under steam load, would produce very high domestic hot water efficiency because the standby loss would be practically nil. During summer operation, if the boiler was exceptionally well insulated and a secondary air door provided to retard air circulation within the boiler during off periods, the standby loss could be brought down to approach that of a gas-designed water heater.

With these ideas in mind we looked about for a manufacturer who would build a boiler to our specifications. We were quite unsuccessful for a while but finally did find one who was willing to risk the venture. A. J. Donohue of the Simplex Gas Products Company, who is also a design engineer for the Burnham Boiler Corporation, heard our story and became interested in the problem. We immediately went to work with him in the design of a gas boiler with a built-in domestic hot water coil.



Arrow points to tankless water heater installed in vertical cast iron sectional boiler. Outside boiler jacket has been removed to show relation of operating parts



Water heating unit such as that installed in the boiler on the left

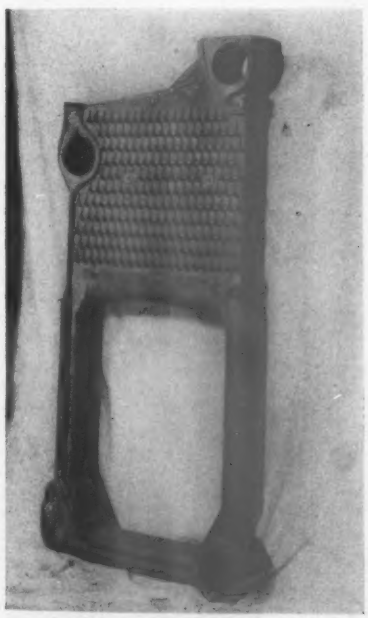
The results obtained on our first installation were so encouraging that we decided to put more in the field. Fortunately, at that time we had a building development of one hundred houses under way in which we had about seventy conversion burners already installed. The builder was willing to cooperate so we continued along with the new boilers instead of the conversion burners. As these jobs were installed they were watched very carefully and checked. Improvements in control and adjustment were made here and there until finally we were able to standardize on a definite set-up.

We designed this boiler originally to provide domestic hot water for single families only. We did not expect that an instantaneous coil of this size could produce sufficient hot water for two families. We installed them only in single family houses, but to our amazement we soon discovered that about fifty per cent of these people were renting out their basements and that the boilers were supplying hot water for two families and doing a good job of it. There has not been one instance where we have been unable to deliver sufficient hot water with the instantaneous coil. We were prepared, if necessary, to install a storage tank and a tank coil where the occasion required it but thus far it has been unnecessary.

Used in 2-Family Homes

We were also skeptical about using these boilers on hot water heating jobs, but we did try three of them, two of which were installed in physicians' houses, and the results were very satisfactory. The gas consumption on these three are noted on the consumption lists attached hereto. We now have twenty forced circulation hot water heating jobs with instantaneous coils in two-family designed houses and we have not had an insufficient hot water complaint on any of them thus far. We have orders for fifty more from the same builder for delivery in the early spring.

The boiler which has evolved to this point is not to be viewed as the last word for this type of equipment. It has, however, all the essential features necessary to provide the results that we want and it is, therefore, a distinct step forward. There are, no doubt, many refinements that will develop from this point on, but we have at least made a successful start and we have proven that it can be done.



Boiler section showing extra push nipple opening below water line for intersectional circulation

I should like to stress at this point that it is important to use only equipment which meets the following proven standards;

1. The boiler must have good internal water circulation. I refer here to the boiler water itself, which is the heat-exchanging medium. The boiler sections must be so constructed that they offer a minimum of resistance to the water circulation. The push nipples between sections must be large and properly placed. Unless the boiler water circulates freely, it cannot transfer its heat rapidly enough to the hot water coil to provide a constant flow of hot water and inconsistent and inefficient operation will result.
2. The domestic hot water coil should be an internal coil, that is, it should be a coil immersed directly within the boiler water. This is necessary because external coils are difficult to insulate and are usually beset with circulation difficulties.
3. When an instantaneous coil is used it should have a minimum of 12 square feet of surface and should be so placed within the boiler that it will receive the maximum volume of boiler water circulation within the shortest time.
4. The aquastat controlling the hot water cycle must be placed so that the burner will operate to maintain the domestic hot water temperature without excessive over-ride.
5. The boiler must be adequately insulated. We use a complete covering with three-ply air cell asbestos and then fill with rock wool between this jacket and the metal jacket.
6. The boiler must be adequately sized. Fifty square feet should be added to the required radiation of the house for each bathroom where tankless coils are used and one and one-half square feet per gallon of storage capacity should be added to the required radiation where tank coils are used. There is some difference of opinion regarding boiler capacity allowances for instantaneous coils. Some think that additional boiler capacity is unnecessary where instantaneous coils are used. I do not agree with this viewpoint. We have some installations that apparently are running all right even though the boilers are close to the line regarding the required radiation with no additional capacity for hot water. It is probably correct to assume that the hot water and heating demands will not always be coincident and that the hot water demand is usually only for a short duration of time and that the boiler is sized for zero degree outdoor temperature. If for any reason more than the normal amount of hot water were to be used, such as on a cold wash day, the house would not receive very much heat because the hot water demand will always take precedence over the heating demand on undersized boilers. I do not think it is sound practice to size these boilers without suitable allowances for hot water.
7. For efficient summer operation, the volume of water in the boiler should be properly proportioned to the capacity of the instantaneous coil. In other words, a coil having a minimum draw capacity of three gallons per minute at 80 degree rise should not have more than 30 gallons of boiler water capacity. We assume that a boiler with 30 gallons water capacity should not have much greater standby loss than a 30 gallon storage type water heater when the insulation is adequate and the same in both cases. We have not attempted to use an instantaneous coil on boilers larger than 500 square feet of boiler capacity because larger homes usually require a greater volume of hot water than our present coil can produce. However, we are not limited in this and larger coils will, no doubt, be available in the future.
8. The best type tempering valve obtainable must be used with both tank and tankless coils. The tempering valve not only prevents excessive hot water temperatures to reach the faucets during winter operation but it also increases the capacity and efficiency of the equipment. Through proper adjustment of the tempering valve, the hot water stored in the coil will not be emptied too quickly and additional draw-off capacity will result.
9. A secondary air damper that will automatically close during off periods of the boiler should be provided. This, of course, is to prevent circulation of cold air through the boiler during off periods and thereby increase the standby loss.

Performance Requirements

If all the above principles are followed, the following minimum performance requirements should be obtained:

1. With the boiler water set at 180 degrees, hot water delivery should be at the rate of 15 gallons during a five-minute draw period with a minimum water temperature of 130 degrees when the incoming water is at 60 degrees. The gas burners should not come on until about 15 gallons have been drawn.

2. The standby loss should not exceed 6 cubic feet of 540 B.t.u. gas per hour for a 72-hour test period in an average room temperature of 60 degrees. The above minimum test requirements have been adopted by us and also by The Brooklyn Union Gas Company.

By observing the foregoing design specifications and minimum test requirements, we have been able to obtain the following results:

On 31 installations with separate meters on the boilers the average consumption per meter was 6,300 cubic feet of 540 B.t.u. gas per month during last July and August. Assuming the average draw to be 50 gallons per day per customer, we obtained hot water at the rate of 4.2 cubic feet per gallon. On actual tests in the field we have

obtained efficiencies as high as 2.06 cubic feet per gallon. Some customers claim to have sufficient hot water during the summer from the pilot light alone with the main burners shut off. Another customer, who has a tank coil with 40 gallons storage capacity, claims he only allows the boiler to run on Mondays during the summer and that he has sufficient hot water to last for the whole week.

These, of course, are isolated cases and cannot be taken as typical, but they do indicate that the possibilities for this equipment are at present unpredictable. The efficiencies obtained will, of course, depend upon the ratio of capacity to actual draw, as this equipment follows the same rule as any other heating equipment, that is, the closer the equipment is used to its full capacity, the greater the efficiency obtained will be. Actual tests show that below 50 gallons per day draw, 3.6 to 4.5 cubic feet per gallon can be expected and that above 50 gallons per day draw, 3.6 to 2.06 cubic feet per gallon can be obtained.

On the 31 installations mentioned above, no high bill complaints were received during July and August. On these same jobs during the month of June three high bill complaints were received. Of these three, two were not justified and one was justified because of improper adjustment of the equipment. As some heating was included in the June figures, these figures will seem somewhat higher. During winter operation, the efficiency has been so high that 90 per cent of the installations are obtaining hot water and heating for less than they should be obtaining heat alone based on the actual degree days experienced and the required radiation of the houses. Mr. Beck of Brooklyn Union estimates that the average single family with 50 gallons per day draw will use about 3,000 cubic feet per month for hot water during the heating season. Our experience would indicate that this figure is too high; however, since we have no set-up for testing winter operation, we will not commit ourselves on this point. We do know that our boilers are very efficient for heating and hot water because almost all of them are operating at a gas factor for hot water and building heat of .21 cubic feet of 540 B.t.u. gas per degree day per square foot of radiation, the only exception being in new houses, during the first few months of operation, while these houses are drying out.

We have listed 43 jobs showing the gas consumption during June, July and August. Thirty-one of these have separate meters on the boilers and the other 12 have only one meter for all appliances. These 43 were all the jobs we had in operation during the full Summer season. Some of these were also in operation during last winter and we have listed the consumption for the winter season on these jobs. During the summer and autumn we installed about 160 more jobs, the operating figures for which are not yet available in tabulated form.

Some of the advantages of all-year hot water supply from central heating plants appear to be as follows:

1. The boiler is in continuous operation, eliminating starts and shutdowns. As you know, these seasonal starts and shutdowns are becoming quite a problem in companies that have a large number of house heating accounts.
2. The boiler, being in continuous operation, is kept in good condition and rust and scale do not form on the flue ways and fire pot during summer idleness. The

CUBIC FEET OF GAS (540 B.t.u.)—BURNHAM-SIMPLEX BOILERS WITH INSTANTANEOUS HOT WATER COILS—YEAR 1940

Houses with Separate Heating Meters

No. of Families	*Sq. ft. Radiation**	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
1	372	110600	75900	69000	42600	14700	11400	8900	9800	3800	22600	40800	59800
1	187	51200	35500	28200	15100	6200	2700	3200	700	1900	7100	13000	18700
1	187	71100	43400	20200	30700	10900	7100	6700	7200	6700	16000	25800	35800
1	162	52600	35100	33600	23300	8200	2900	5600	4500	3900	10500	21900	31000
2	184		41400	21200	29200	15300	12300	6700	7700	9100	12400	19400	29300
1	269		23700	41300	17200	10100	6900	6200	4700	5800	15000	27500	42400
1	200				27500	23400	9900	6000	9000	5800	10900	15900	28100
2	327						11300	15700	13500	12600	34200	56200	54700
1	282				17700	12400	7100	4300	5800	8400	12200	30200	51100
1	162	44900	27500	23200	13400	8500	6700	6700	5800	4200	8600	10900	22200
1	187	46600	63900	41300	25000	6500	5000	3500	5400	5100	9700	16000	24400
1	221	56000	48300	31300	2100	5600	5100	4800	6700	3500	14900	23000	11400
1	162	48000	31700	28500	20500	8400	6400	6900	6300	6600	12100	20300	26400
1	169	41500	22500	23500	10800	6800	4400	5300	3500	3900	6100	14100	15600
1	222		17000	40100	22700	8800	6100	5500	6100	6100	11800	20400	28600
1	218	55200	50000	49400	32000	15400	12200	9100	6200	12200	16700	32000	41700
M.D.	HW 585	102500	59100	60700	39500	12700	7400	6200	5500	7000	18600	30000	44800
2	162	65500	25600	22700	13600	6900	5900	5300	6300	5600	12600	16300	22900
M.D.	HW 563	98100	66100	65200	49700	22300	11200	9900	10400	10600	22300	44300	60700
1	187	55500	36200	35700	24600	9300	7300	7500	7200	6500	13700	24600	36200
2	189	61300	40900	39900	29800	10400	8800	8800	9600	12300	22200	29400	38800
2	171	64100	39100	37300	23400	10000	6200	6100	6400	6400	13300	19500	26600
2	265			42800	16000	11300	8400	3500	1100	5100	12900	23400	35300
1	HW 280	49600	34400	33300	28200	13300	9700	5200	2700	6200	16800	25700	33200
1	265					8300	8100	9900	8100	10200	20600	36800	33400
1	167	37600	24000	24700	15700	7200	4100	5000	1700	5800	C.G.I.	24900	16900
1	251		28800	56000	4900	1500	1300	600	4700	5300	12900	24900	42900
1	187		43900	40200	27200	8700	6400	5500	3500	3300	9600	23300	32600
1	214			25500	13700	14000	5600	4200	2100	3700	10900	19400	26900
1	257	67700	46500	42800	28200	10800	6200	5700	6000	7000	12600	31100	39200
1	200					7200	11900	12900	14000	10000	15100	25700	38700

*Steam unless otherwise noted.

Houses with One Meter Only*

No. of Families	*Gas Refrig-erator*	*Sq. ft. Radia-tion*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
2	1	184	69300	48900	40600	23900	6700	2700	4000	8000	8600	11100	17000	26700
2	1	189			39000	15000	5800	3900	1300	10000	11200	15900	26300	32900
1	None	228				29800	20300	9800	6100	7500	9500	13800	23100	C.G.I.
1	None	218	93700	66900	43300	28600	11300	8600	8100	8000	10500	15300	25200	32300
2	1	200						3600	9800	13800	8400	15900	23200	36800
2	None	218			55100	40800	14200	8300	7600	9200	8600	16400	28600	39600
2	2	184			7900	26800	9000	10000	5300	6800	10400	16100	25100	35300
2	1	184			50200	9600	13600	11800	9800	11100	12400	12100	20200	26100
2	2	218	20000	32700	33000	25100	14900	14000	10700	12300	13500	14900	22200	30600
1	None	228				29000	18100	12400	8200	9000	10800	17000	26600	39400
1	1	206	66100	46800	45600	27200	10700	9600	9000	9100	C.G.I.	21800	29000	38100
2	1	184	84100	56200	40900	26400	12300	9600	7800	9500	9400	14100	21400	31100

*These figures include gas consumed for cooking and refrigeration, except where noted.

controls do not become stuck and inoperative. The customer has the advantage during late spring and early autumn of turning on the heat by merely raising the thermostat should she so desire on cool days. Some customers like to turn on the heat on damp days during the summer and they really appreciate the advantage of having complete control within their own hands. Cellars are kept free of dampness.

3. Maintenance costs are reduced to a minimum as there is only one appliance to be serviced.
4. The sales resistance of having to sell two appliances instead of one is eliminated and the first cost to the customer is considerably lower.

Our experience definitely indicates that summer-winter domestic hot water from central heating plants has arrived. The gas industry should lose no time in getting behind the idea, thereby selling many jobs that would otherwise go to our competitors.

I have been informed that several manufacturers of gas boilers are now in the process of developing equipment of this type, that you will soon see their equipment on the market.

Development and construction of a new boiler involves new patterns, new castings, tooling up and considerable experimentation and it is a most expensive operation for any manufacturer. Unless the manufacturers receive the necessary encouragement and cooperation from our industry they can hardly be expected to go into this thing with any fair degree of enthusiasm. Our part lies in first deciding that we want to sell this type of equipment and then in establishing what our minimum performance standards will be. This should be followed by providing all the engineering and field assistance that we can give. We also must permit test installations to be made in the field so that we, as well as the manufacturers, can prove that the equipment is a success before going ahead.

I should like to point out in closing that we received the most sympathetic, inspiring and progressive attitude from our President, Miss Mary E. Dillon, without which these boilers could not have been brought to their present state of perfection.

CP Demonstration Winners Get 29 Cash Prizes and National Recognition

Jeannette Campbell

JEANNETTE CAMPBELL of the Minneapolis Gas Light Company, Minneapolis, Minn., was awarded first prize of $100 heading the list of 29 cash prize winners in the nationwide contest for the best CP gas range demonstrations by home service representatives. The contest closed on March 15 and the final judging by a distinguished panel of judges took place April 4. It was sponsored by the Home Service Committee of the American Gas Association, Albertine Berry of Dallas, Texas, chairman, through a special committee headed by Colleen Fowler of Kansas City and W. E. Bolte of Brooklyn. The prizes were contributed by the Sales Promotion Committee of the Association of Gas Appliance and Equipment Manufacturers.

The large number of entries from all parts of the country were judged on a three-point basis including a CP range slogan, script and demonstration mechanics.

Second prize of $75 was won by Phyllis Ward, Southern California Gas Company, Los Angeles. Third prize of $50 went to Margaret Phillips, Florida Power & Light Co., Miami, and fourth prize of $25 was awarded to Helene Gram, The East Ohio Gas Co., Cleveland.

The contest brought out an interesting variety of slogans for the CP range, ranging from simple phrases, such as "Cook's Paradise," "Be Free with CP," "Carefree Cooking the CP Way," "Cook with Confidence, Serve with Pride—CP," "Be Thrifty —Have Liberty with CP," etc., to catching rhymes such as these: "Stay Modern and Change to a CP Gas Range," "It's Time To Change to a CP Range," "Speed with Ease, CP Will Please," "If from Worry You'd Be Free, In Your Kitchen Employ CP," etc.

Judges for the contest were: Eloise Davison, director, New York Herald Tribune Institute; Katherine Fisher, director, Good Housekeeping Institute; Mrs. Virginia Hart, associate editor, *House & Garden*; Earl Lifshey, housewares and major appliance editor, *Retailing*; and Ada Bessie Swann, associate editor, *Woman's Home Companion*.

In addition to these named above, twenty-five prizes of $10 each were awarded to the following: Kathleen Atkinson, Providence; Naneen Barr, San Bernardino; Elizabeth Baum, Blue Island, Ill.; Loretta Brady, Orange, N. J.; Dorothy Church, Brooklyn; Ruth Dickey, Boston; Caroline Ewing, Okmulgee, Okla.; Grace Frusher, Shawnee, Okla.; Doris Heidrick, Wichita; Mary Louise Hurster, St. Louis; Helen Kirtland, Buffalo; Helen Lillibridge, St. Joseph, Mo.; Irene Muntz, Rochester.

Also, Ann O'Keeffe, Morristown, N. J.; Beth Porter, Glendale; Helen Reilly, Summit, N. J.; Betty Schillo, Niagara Falls; Marguerite Scroggie, Santa Monica; Lucy Slagle, Atlanta; Elsa Steinberger, Brooklyn; Eliza Stephenson, Asbury Park, N. J.; Frances Stevens, Grand Rapids; Hulda Ungericht, Columbus; Gladys Vaudreuil, Roanoke; and home service department, Citizens Gas & Coke Utility, Indianapolis.

Gas Refrigerator Sales Jump 2½ Times

ORDERS for gas refrigerators for the current year are running at the rate of almost two and a half times the same period of 1940, George L. Jones, vice-president and general sales manager of Servel, Inc., told the New England Gas Association on March 28.

Mr. Jones stated that one and one quarter million gas refrigerators have been sold in this country since they were first introduced 15 years ago this Fall, and that these refrigerators are consuming gas at the rate of $23,000,000 worth per year. Capacity of the refrigerator has been increased nearly 40 per cent and the efficiency, represented by the consumption of gas, has been improved nearly 30 per cent.

Judges of the CP demonstration contest. Left to right: Mrs. Virginia Hart, Eloise Davison, Earl Lifshey, Ada Bessie Swann, and Helen Kendall (representing Katherine Fisher)

A Word to Industrial Gas Men from the Rate Committee

Clinton Lee Follmer

By Clinton Lee Follmer*

Chairman, A. G. A. Rate Committee

THE activities of the Rate Committee are similar to those of committees of the Industrial and Commercial Gas Section in that the committee serves as a clearing house for ideas. These ideas, as in the case of your own committees spring from the attempt to meet the constantly changing problems of competition. The correlation of these ideas as developed by research by the subcommittees finds expression in the committee's annual report.

The Rate Committee has also a function perhaps equally as important in the way of a study of ideas that are expressed from time to time in the decisions and orders of judicial and regulatory bodies.

Simplicity in Rate Structure

These latter ideas are far-reaching in their influence upon rate structure, particularly in the industrial field where they are apt to run counter to the ideas of the industrial gas salesman. I refer to the matter of so-called "class rates." It is quite natural that the salesman should like to have a flexible arrangement of rates that would enable him to shade his price where competition is most difficult. It is also quite natural that the regulatory bodies should prefer an inflexible arrangement which obviates any possibility of undue discrimination. The tendency has been toward the latter relatively inflexible type of structure with its resultant simplicity. This simplicity is exemplified in the rate structure of the Consolidated Gas, Electric Light & Power Co. of Baltimore. Notwithstanding the great variety of industries in this city, one basic commercial schedule accommodates 97% of the total number of commercial and industrial customers. Two industrial schedules suffice for the remaining 3%, who are responsible for almost two-thirds of the total commercial and industrial gas consumption.

Several other studies in which the committee is engaged are of especial interest to the industrial man. One of these is an investigation of the tax and fuel rate adjustment clauses in use throughout the industry, a partial resumé of which appeared in the committee's 1940 report. Both of these factors will require increasing consideration in the near future. Fuel rate clauses are quite common and are usually confined to industrial schedules. Tax rate clauses have so far been infrequently applied.

National Defense Angle

Another is a study of extention policies in cases of "doubtful permanency" such as are particularly prevalent at this time in the way of projects for the production of materials for National Defense. The industry ordinarily has very little of the problem of temporary use of its facilities, but has been confronted with it in increasing proportions in the past six months. The problem is brought about not by the building of plants for the production of defense materials and the expansion of existing industries for the same purpose, but by the expansion of military and naval posts and cantonments to accommodate defense personnel, and the provision of shelter for the influx of factory workers to centers of defense activity.

It may be said that indirectly through its individual members the Rate Committee is dependent in a considerable portion of its activities upon you—the industrial gas salesman. You constitute the intelligence service in the fight with competition in the industrial field, a field which year by year is becoming more and more important in maintaining revenue. You supply the information as to relative values and customer acceptance from which the rate man must fashion his rates. Here again, although the objective is the same, we find a conflict of ideas; the salesman is interested in selling more and more gas and the lower the rate, the more gas is likely to be sold; the rate man knows more acutely the difficulty of restoring a rate level if the salesman's forecast of the increased sales and revenue, even when discounted for optimism, should not materialize.

The rate man's natural tendency is to resist reduction. He is also inclined toward the theoretical, and rate structures trended in that direction for many years. In recent years, however, the relatively low cost of storage facilities for liquefied petroleum gases has forced a reconsideration of one of the basic elements of the industrial rate structure, viz., the demand element. The demand form of rate which has always met with a certain amount of unfavorable reaction from the customer has been yielding to a form in which an annual commitment is used. This commitment, payable in monthly installments, may be even greater in amount than that formerly paid in the way of demand charges but includes the quantity of gas represented by the first block of the rate. The commitment is constant, not varying in any way with the demand, and this type of rate seems to find much more ready acceptance from the customer than the demand form.

Cooperation Necessary

The commitment form of rate was the product of cooperation between the rate man and the industrial gas salesman. As I have indicated before, I feel that the necessity of such cooperation cannot be stressed too highly. The more the salesman knows about the rate structure and the more the rate man knows about the salesman's problems, the more likely is the proper form of rate to evolve. Of equal importance, however, is the salesman's attitude toward the rate. A complete knowledge of form value is often the difference between a proper attitude toward a rate and an improper one. The salesman who makes the rate man's life miserable by a continual complaint that the rates are too high should indulge in a bit of introspection, particularly in the way of a study of the market and of form values. I am prompted to make that observation by my experience. It has been my pleasure for a number of years to be associated with an industrial gas salesman whose success in his field is generally recognized. No matter how hard the nut to be cracked, in the way of disparity between the prices of gas and competitive fuels, I have yet to hear him say that the rates are "too high." That is not to say that all classes of business are securable, which of course, would be a "consummation devoutly to be wished," but

Presented before A. G. A. Conference on Industrial Gas Sales, Lord Baltimore Hotel, Baltimore, Md., March 13 and 14, 1941.

* Manager, rate research department, Consolidated Gas, Electric Light & Power Company of Baltimore.

rather that by reason of his extensive knowledge of his market he knows that the profits that might be had by lowering the rate to secure certain business are not worth the sacrifices in the more profitable business already obtained.

The increasing importance of the part which the industrial gas salesman must play in the future of the industry is shown by a review of the consumption and revenue of the manufactured gas industry for the past 12 years. In that period, only by virtue of a tremendous increase in house-heating sales, has the domestic consumption including house heating held its own, accompanied, however, by a decline in the consumption per customer. The industrial and commercial consumption increased 29% with an increase in the number of customers of only 7%, indicating a broadening of the field of use. Even though, unfortunate as it may be to have to mention it, the total revenue from this class of business suffered a 6% reduction in spite of the increased consumption, it still remains a fact that the balance sheet would have presented a much less pleasing appearance but for the efforts of the industrial man in extending the field of use. Some 19% out of the 29% increase in consumption referred to has occurred in the last two years, and it is to be hoped that that trend may continue. Defense needs should assist materially in maintaining it for the next few years.

I have been able in this brief talk to touch upon a few of the high spots of interest to the industrial gas salesman. I shall feel that it will have been well worth while if I have succeeded in impressing upon your minds that in your relations with the rate man the one word which stands out as an essential to the shaping of a proper form of rate structure is the word "Co-operation."

Reports of the Baltimore Round-Tables

THE following reports cover the Round-Table Information Sessions held in connection with the 1941 A. G. A. Conference on Industrial Gas Sales, Baltimore, March 13-14:

1. *Metal Treating and Melting:* Co-leaders, Major Fred M. Reiter, Chairman, Metal Treating and Melting Committee, and Hale A. Clark, Chairman, Committee on Use of Gas in National Defense.

Discussion brought out the need for further data on adaptations of gas to the heat treatment of aluminum and magnesium castings. It was learned that research work along this line is being conducted by the Michigan Consolidated Gas Company in co-operation with the Dow Chemical Company and the Aluminum Company of America.

It was suggested that the forging of aluminum be urged for gas operation, the application being both successful and sizeable as to gas consumption. Comment on the desirability of using recirculating fans in smaller vertical retort carburizing furnaces developed a split of opinion, with the citation of successful applications both with and without fans. The effects of exhaust fan systems in plants heated by gas unit heaters were discussed, it being disclosed that both poor combustion and ineffective plant heating could result. It was suggested that the use of tempering heaters in make-up air inlet ducts might be a solution.

Concerted industry effort was urged to combat the predisposition of industry to specify electricity for certain heat treating needs in connection with defense production.

2. *Gas Air Conditioning:* Leader, Charles R. Bellamy, Chairman, Joint Committee on Summer Air Conditioning.

The outstanding feature of this meeting was a talk by C. E. May, utilization engineer, New Orleans Public Service, Inc., New Orleans, Louisiana, having to do with the progress made by his company in this field. Mr. May showed many interesting slides and pictures of up-to-date gas-fired air-conditioning installations and of various types of equipment, and presented charts giving valuable operating and cost data.

Following this talk on the general subject, special phases of air conditioning work were covered by members of the Air-Conditioning Committee: G. F. Zellhoefer, H. W. Heisterkamp, G. L. Simpson, J. K. Knighton, J. deB. Shepard, J. C. Patterson and others. Several of these speakers made mention of the important part that gas industrial air conditioning is playing in the national defense program, but for obvious reasons detailed accounts of this work could not be given.

3. *Sales Managers:* Leader, George F. B. Owens, Vice-Chairman, Industrial and Commercial Gas Section.

At this round-table, points having to do with the organization of industrial and commercial gas sales departments, and their personnel problems, were confidentially discussed between non-residential sales managers representing at least 25 gas utilities. The managerial problems arising from sudden increases in industrial gas demands (and installations of industrial gas-using apparatus) as a result of defense activity, were accorded considerable attention. The possible loss of sales personnel to the draft was recognized as a potential embarrassment, and it was suggested that as many replacements as possible be drawn from within existing company rosters.

Air Conditioning Research Launched at A. G. A. Testing Laboratories

Leon Ourusoff

UNDER authorization of the Executive Board of the American Gas Association a comprehensive program of research in gas summer air conditioning is being inaugurated at the A. G. A. Testing Laboratories, Cleveland. Organization and supervision of the project are under the direction of the Joint Committee on Summer Air Conditioning of the Industrial and Commercial Gas and Residential Sections, Charles R. Bellamy, chairman, after financing had been arranged through the efforts of Davis M. DeBard, chairman, Committee of Executives on Air Conditioning.

Details of the program, including technical and economic phases of the project, are being worked out by a subcommittee of the Joint Committee on Summer Air Conditioning. Known as the Technical Advisory Committee on Summer Air Conditioning Research, this group is headed by Leon Ourusoff, Washington Gas Light Company. Other members are: Charles R. Bellamy, Harold S. Birkett, W. F. Friend, John deB. Shepard and Eugene D. Milener, secretary.

The Technical Advisory Committee met at A. G. A. Headquarters on April 17, together with representatives of the firms manufacturing gas summer air conditioning equipment and of the Laboratories, and studied the several tentative plans for conducting this project. The great differences in the basic engineering cycles for obtaining the desired cooling and dehumidifying effects which are employed in the various systems which have been developed for the market introduces more than usual difficulty in developing a working basis for this research project. This, together with all other angles of the subject, were thoroughly explored during the meeting.

A definite program for the first two months was decided upon. Members of the committee, manufacturers and others will work with the Laboratories during this period at the end of which the details of the program for the balance of the first year will be prepared.

Pin the posy for printed promotion on Consolidated Gas Electric Light and Power Co. of Baltimore—for an industrial and commercial space heating broadside suggesting "A New Way TO HEAT a Building." Conceiving of a fan-plus-cooling-coil-plus-unit-heater ducted line as an air conditioning system, the 2-color fold-out describes: a 40% saving in heating a restaurant, cleanliness in warming a grocery, handiness in serving remote offices at a theater and a factory, and space-saving in conditioning a machine shop. Good photos, good testimonials, good advertising production, and a good idea—it'll work.

◆

Spring-Fever Want Ad. Available! Energetic young man for conducting gas griddle and coffee urn service tests at National or American League ball parks any afternoon from date.

◆

Describe your proudest job in your company house organ; then send printed copies to the customer company and all similar firms in the "prospect" classification. All at once, you'll be selling your own company, your ace account, and new business.

◆

Genial John Mooney, hotel range expert, again this Spring takes time to run his famous Friendship Rooms. From all reports, the setup in Hollywood at the Florida-Georgia meeting won you another gold star, John. Yessir, it's a swell idea—and you know how to sell it.

Ghost factories come to life. Brooklyn Union notes a "growing demand for rehabilitated low-rental industrial buildings" thanks to the defense program—and finds the new tenants of such long-abandoned plants universally in favor of gas unit heaters. Reasons?—New central heating installations and fancy plumbing in an old structure is like sending good money after bad; unit heaters can be packed up and taken along when it's time to abandon the property again; floor-space (and how it counts these days!) is saved.

◆

300 references to significant data published since 1939 and bearing upon the industrial and commercial use of gas, have all been wrapped up in a handy package for you to use—along with interpretive comment. Get your A. G. A. Industrial Service Letter No. 32, just released, and map out a reading program to keep your department up with the parade.

◆

The best eateries in your town are all excited these days about National Restaurant Week, May 5 to 11. Play along with 'em, Buddy, play along.

◆

"That's-a-new-one-on-me!" Department. Ershler & Krukin have taken two thermostatically controlled gas griddles, mounted them side-by-side at table level, insulated heavily each of four perforated-bottom food drawers below the burner box, equipped the space the drawers occupy with a refrigerating coil and a recirculating fan, unified the whole in stainless-steel—and, lo, given birth to the hot-dog-and-hamburger chef's dream.

◆

Thanx, fellas, from the bottom of your Industrial Publicity Department's black heart—for sending in your Conference papers this year well before the meeting dates—and letting us give the trade paper editors advance breaks. What a difference it made in developing editorial interest!

◆

Prove the point in print—perhaps these clippings will help: "New Equipment Cuts Food-Fuel Costs," Will C. Grant, SODA FOUNTAIN, February, p. 18; "Industrial Drying and Baking Equipment," F. H. Faber, INDUSTRIAL HEATING, February p. 176; "Controlled Atmospheres—A Composite Abstract," METALS AND ALLOYS, February, p. 198; "Low Humidity for Plastic Process Provided by Lithium Chloride and Refrigeration System," T. H. Mabley, AIR CONDITIONING & REFRIGERATION NEWS, February 26, p. 14; "Alloy Drop Forgings Normalized at Low Cost," Reginald Trautschold, STEEL, February 3, p. 79.

INDUSTRIAL AND COMMERCIAL NATIONAL ADVERTISING FOR MAY

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full-page advertisements will appear in the trade and business magazines listed below during the month of May. These advertisements, which will appear in 16 publications reaching a total audience of 288,587, are prepared in cooperation with the Committee on National Advertising as a part of the Association's national advertising campaign.

General Manufacturing

BUSINESS WEEK (May 3—⅔ page ad)—For all-out aid to faster production—look to modern high-speed Gas equipment.

BUSINESS WEEK (May 31—⅔ page ad)—Speed defense production with today's fastest quality fuel—Gas.

Ceramic Industry

CERAMIC INDUSTRY—Here's *one* Insurance Policy that doesn't call for premiums! Modern Gas equipment is your insurance of speed, flexibility, close control and economy. (General Ad.)

Food Industry

FOOD INDUSTRIES—Gas-fired ovens back up quality products. U. S. meat processing requirements are rigid but Gas helps to meet them . . . Armour and Company, Denver, Colorado.

BAKERS WEEKLY (May 3)—"Gas . . . most economical and convenient fuel for baking"—Mrs. Baird's Baking Co., Houston, Texas.

Metals Industry

THE IRON AGE (May 8)
STEEL (May 19)
METALS & ALLOYS
METAL PROGRESS
INDUSTRIAL HEATING
HEAT TREATING AND FORGING
—Here's *one* Insurance Policy that doesn't call for premiums! Modern Gas equipment is your insurance of speed, flexibility, close control and economy. (General ad.)

Restaurant Field

AMERICAN RESTAURANT—On Atlantic City's boardwalk GAS holds first place.

CHAIN STORE AGE (Fountain and Restaurant Section)—"Always preferred Gas and modern Gas equipment"—May Company's Wilshire Store Tea Room, Los Angeles, Calif.

Processing Field

CHEMICAL AND METALLURGICAL ENGINEERING—Here's *one* Insurance Policy that doesn't call for premiums! Modern Gas equipment is your insurance of speed, flexibility, close control and economy. (General ad.)

Hospital Field

MODERN HOSPITAL—"Gas and modern Gas equipment preferred tools for specialized food loads" . . . Jewish Hospital, Philadelphia, Pa.

Preparedness Is Keynote of Distribution Conference

The speakers' table at the joint Distribution-Motor Vehicle luncheon conference devoted to national defense problems. Left to right: G. Hanshaw; C. S. Goldsmith, vice-chairman, Distribution Committee; J. D. von Maur, Toronto; S. C. Preston, president, Peoples Natural Gas Co.; D. S. Keenan, president, Carnegie Natural Gas Co.; H. L. Gaidry, vice-chairman, Technical Section; J. B. McNary, president, Canadian Gas Association; Major T. J. Strickler, president, American Gas Association; R. H. Clark, chairman, Motor Vehicles Conference; D. P. Hartson, chairman, Technical Section; L. W. Tuttle, chairman, Distribution Committee; C. E. Paige, president, The Brooklyn Union Gas Co.; Major Alexander Forward, managing director, American Gas Association; E. P. Durfee, Consolidated Edison Co. of N. Y. Inc.; P. H. McCance, vice-president, Philadelphia Co.; C. E. Bennett, president, The Manufacturers Light and Heat Co.; and A. Gordon King, secretary, Technical Section

By the DISTRIBUTION CONFERENCE EDITORIAL COMMITTEE

Under the Leadership of Harold L. Gaidry, Vice-Chairman, Technical Section

BRINGING the full weight of their practical experience and training to bear on the extraordinary problems of the day, 428 distribution engineers from all parts of the country took part in the eighteenth annual Distribution Conference at the William Penn Hotel, Pittsburgh, Pa., April 21-23, held concurrently with the first annual Motor Vehicles Conference. Under the gavel of L. W. Tuttle, of the Public Service Company of Northern Illinois, Oak Park, chairman of the Distribution Committee, the conference made great strides in the direction of solving the most pressing operating and national defense problems.

After Chairman Tuttle's opening remarks in which he paid tribute to the distribution men, Charles E. Bennett, president of the Manufacturers Light and Heat Company, representing the Pittsburgh Gas Co., welcomed the delegates.

"Business as Usual" Scored

Following closely the pattern of international events, a substantial part of the conference was devoted to a study of the distribution man's part in national defense. In the feature address of the Monday morning session, Clifford E. Paige, president, The Brooklyn Union Gas Company, and past president, American Gas Association, emphasized the fallacy of the "business as usual" school of thought. He stressed the fact that our industry would soon be facing the problem of young employees being taken into the military service of our country in increasing numbers. Stating that the gas engineers had made great progress with the research facilities available, Mr. Paige warned the conference that many ambitious programs the engineers contemplated might have to be set aside momentarily while we learn what to do in the face of any prospective emergency. Mr. Paige's remarks were underscored by other speakers later in the day.

Following Mr. Paige, A. W. Fuller, Consolidated Edison Co. of New York, Inc., chairman of the Subcommittee on Meters and Metering, gave a very interesting summary of the work of his committee.

The subject of "Industrial Metering" which has become increasingly important with the speed up of industrial activity and the tremendous growth of the industrial gas load, was thoroughly reviewed in a valuable paper by Allen D. MacLean, vice-president and chief engineer of the Pittsburgh Equitable Meter Company. After pointing out the essential differences between industrial and domestic metering, Mr. MacLean analyzed the characteristics of the orifice meter, the so-called rotary displacement meter, and the diaphragm-type positive meter.

Stating that the proving of industrial meters varies greatly between companies, Mr. MacLean strongly urged gas company management to give close attention to this subject. Period of proving, type of proving equipment, expected accuracy, flows at which to prove and many other details should be determined and, if good industrial measurement is to be obtained, a rigid policy adopted and pursued. While domestic meters are removed and returned to the meter shop for proving at stated periods, industrial meters are too often left to chance, he said.

A. F. Benson, of the American Meter Company, amplified Mr. MacLean's statement of the accuracy of orifice meters over wide ranges of flow where installations are paralleled with a positive meter for low flows.

The morning session closed with a report of the Subcommittee on Cast Iron Pipe Standards by H. L. Peden, Consolidated Edison Co. of New York, Inc., chairman.

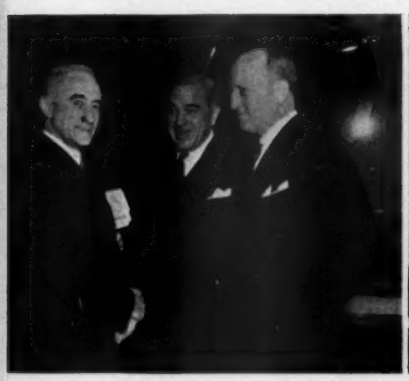
Joint Defense Luncheon

After adjournment of the distribution session, a joint luncheon with the Motor Vehicle Conference group was held at which national defense was the paramount topic. D. P. Hartson, of Pittsburgh, chairman of the Technical Section, presided at the joint meeting and introduced Major T. J. Strickler, of Kansas City, president of the American Gas Association.

Major Strickler congratulated the distribution engineers on their accomplishments and praised the contributions of the Technical Section to the industry's progress. He discussed the gas industry's part in the defense of our country and stated that we must concentrate not only on the task of supplying fuel for war industries but also we must be ever mindful of our obligation to peacetime customers. Extracts from his stimulating address are printed in the leading article in this issue of the MONTHLY.

Distribution Conference Chairman L. W. Tuttle, Oak Park (seated, left), joins Motor Vehicles Conference Chairman R. H. Clark, New York, and some of his co-workers. Left to right, standing, are: R. F. Norris, Mt. Vernon; Randolph Whitfield, Atlanta; Jean Ray, Richmond, and W. A. McCutcheon, Washington

Injecting an international flavor into the conference atmosphere, J. B. McNary, president of the Canadian Gas Association (left) and Keith J. Burnett, Hamilton, Ontario, discuss matters of mutual interest with Major Thomas J. Strickler, president of the American Gas Association



The camera catches a trio of gas-minded executives in close conference. Left to right: Major Alexander Forward, managing director, American Gas Association; Clifford E. Paige, president, The Brooklyn Union Gas Company and past A. G. A. president; and H. Leigh Whitelaw, Pittsburgh

A distinguished gathering of prominent leaders. Left to right, seated: J. D. von Maur, Toronto, "father" of the Distribution Conference; and J. B. McNary, president, Canadian Gas Association. Standing: H. L. Gaidry, vice-chairman, Technical Section, and L. W. Tuttle, chairman, Distribution Committee

The next speaker, E. P. Durfee, of New York, delivered a stirring plea for the gas industry to be loyal, industrious and vigilant to prevent any undermining of our democracy. "Our job is to keep our plants operating full blast; without interruption of service; without waste; without accidents; without breakage of tools or machinery—and yes, to speak frankly, without sabotage."

H. W. Battin, of Philadelphia, conducted the afternoon session of the Distribution Conference, which consisted of an open forum on national defense. Approximately 150 prominent engineers attended this session, many of whom participated in the lively discussions on preparedness for emergency conditions. A. Gordon King, secretary of the A. G. A. National Defense Committee, explained what is being done on a national scope by the Association. Major Alexander Forward gave some "inside" information on the European experiences of gas utilities. Robert H. Clark commented on the position of transportation equipment in national emergencies and urged that old equipment be retained for possible service. R. E. Finley, of Dayton, described his experiences in emergency two-way radio communication for transportation on equipment. C. S. Goldsmith, of Brooklyn, spoke of protecting distribution systems by locking department control points and means of sectionalizing distribution systems for emergencies. H. B. Andersen, of Philadelphia, disclosed an extremely practical method of isolating distribution systems by means of introducing grease into the mains. J. D. von Maur, founder of the Distribution Committee, a Canadian representative from Toronto, contributed some very practical suggestions justifying a preparedness program.

Meter Plant Inspected

At the close of the Monday session between three and four hundred delegates made an inspection trip to the Pittsburgh Equitable Meter Company's plant. The guests were welcomed by the President, Colonel Willard F. Rockwell, and a large corps of assistants conducted the visitors through the extensive plant. Special arrangements had been made to continue the working of the various machines so that the visitors might see meters and other equipment actually being produced on the line. Bus transportation was provided for by the company and a most enjoyable buffet supper was served at the conclusion of the plant inspection.

The Tuesday morning session, April 22, had as its keynote the timely subject of Appliance Servicing. Approximately 250 engineers and operators were in attendance when H. H. Horstman, Public Service Co. of Indiana, chairman of the Subcommittee on Appliance Servicing, opened the meeting with a general report on this committee's work.

Pointing out that there is nothing in the service department more expensive than recurring service orders, Mr. Horstman said that his committee had directed its attention to this problem. A survey of a group of companies revealed that "over a 6-month period it required approximately 1,750 calls to satisfy each 1000 customers who called for service." Figures show this ratio to be uniformly true in the case of all companies studied, even those almost 2000 miles apart being in almost exact agreement. He estimated that 60 per cent of all recurring service orders could be eliminated by proper training of service men, and cited the results accomplished in several companies.

Appliance Servicing Costs Up

A tendency during the past few years for manufacturers to build appliances with much eye appeal and, to some extent, little serviceability, was noted by W. M. Little, Arkansas Louisiana Gas Company, Shreveport, in his paper "Technical Aspects of Appliance Servicing." He stated that "some appliances practically have to be disassembled to facilitate minor adjustments" and that today's service crews have to be mechanically, chemically and electrically minded. He cited figures to show that in the last decade gas sold per customer has declined because of more efficient appliances while the cost of servicing has increased to an alarming point. He recommended that more attention be paid to the hiring and training of service men.

The centralized file method of controlling customer service was described by Wilbur

The Subcommittee on Appliance Servicing at a meeting during the conference. Left to right, seated: C. F. Sucher, New Haven; H. G. Horstman, Indianapolis, chairman; F. W. Batten, Binghamton. Standing: W. T. Shinholser, Columbus; J. M. Pickford, Hammond, and C. S. Goldsmith, Brooklyn

T. Collins, The Ohio Fuel Gas Co., Columbus, who declared that this type of control functions best in medium or large properties, as there is unlimited flexibility to the facilities that are available.

Lively discussions followed the presentation of the Appliance Servicing committee report and papers. Those participating included: Henry Harris, Los Angeles; W. T. Shinholser, Columbus; C. H. Waring, Kansas City; J. N. Pickford, Hammond; J. D. von Maur, Toronto; T. J. Perry, Brooklyn, and L. K. Richey, Detroit.

The report of the Subcommittee on Pipe Joints and Pipe Materials was delivered by T. H. Kendall, Equitable Gas Co., Pittsburgh, in the absence of A. C. Cherry, Cincinnati Gas & Electric Co., chairman of the committee.

G. E. Woods, Jr., Consolidated Edison Co., of New York, Inc., presented an excellent paper prepared jointly with G. E. Garnhart of the same company, covering a technical study of the economics of removing idle meters. Following a comprehensive study made in New York City, it was concluded "that based on prevailing costs and the present duration of residential vacancies, the removal of meters for temporarily vacant premises is not economically justified." The survey indicated that New York City residences (predominantly apartments) remain vacant for an average period of only about 46 days whereas the removal of an idle gas meter was not justified unless there were definite prospects of the premises remaining vacant for at least 17 months after removal of the meter.

At the conclusion of this session, J. B. McNary, president of the Canadian Gas Association, together with Mr. von Maur, emphasized the close relationship of the Canadian and American associations and invited the delegates to attend the annual meeting at Hamilton, Ontario, May 20-21.

Luncheon Conferences Popular

Well-attended luncheon conferences were held simultaneously on Tuesday afternoon, at which many subjects of particular interest to individual delegates were discussed. The attendance at these round-table luncheon groups was as follows: Appliance Servicing, T. J. Perry, The Brooklyn Union Gas Co., chairman—80; Construction and Maintenance, Jeff Collins, New Orleans Public Service Inc., chairman—120; Meters and Metering, A. W. Fuller, Consolidated Edison Co. of New York, Inc., chairman—79.

Opening the concluding day's sessions, M. G. Markle, Public Service Company of Northern Illinois, Oak Park, described an ingenious device called the Flamdicator which is used to determine the comparative combustion characteristics of the company's sendout gas mixtures. Following the theory that burner temperatures were somehow related to the combustion characteristics of different mixtures of peak and base load gases, the Flamdicator was developed. It consists of a 10.2 millimeter Bunsen burner with an air adjustment that can be locked in place, and a stainless steel tip separated and insulated from the base of the burner by an asbestos tube. A thermocouple is attached to the tip just below the edge exposed to the flame, and the cold junction thermocouple is placed directly within the gas air stream, connected so that the E.M.F. of one thermocouple is opposed to the other. Mr. Markle indicated that this device has given satisfactory results although further experiments are being made.

An authoritative report on "Adjusting Appliances for Proper Input for Gas Air Ratio," prepared by Louis Shnidman and Jesse S. Yeaw of the Rochester Gas & Electric Corp., was presented by Mr. Yeaw. This paper was replete with significant facts and reflected the long and thorough investigation made by the authors.

Following the presentation of these papers, a vigorous and enlightening discussion of combustion problems took place, with such prominent distribution engineers as Leon Willien, Chicago; B. Manchester, Omaha; L. H. East, Rochester, and J. H. Wolfe, Baltimore, participating. K. R. Knapp also discussed these papers from the A. G. A. Testing Laboratories' point of view.

L. K. Richey, Michigan Consolidated Gas Co., Detroit, chairman of the Subcommittee on Pipe Coatings and Corrosion, presented a brief progress report in which he stated that the corrosion research program would be maintained in the absence of Dr. Scott Ewing, A. G. A. research associate who is now doing government work. A

The leader's table at the luncheon conference on Meters and Metering. Left to right: H. S. Harris, Los Angeles; A. W. Fuller, New York, chairman; B. F. Worley, Houston, and J. E. Overbeck, Columbus

At the Emco meter plant, three prominent engineers enjoy refreshments. Left to right: Jesse S. Yeaw, Rochester; L. E. Knowlton, Providence, chairman, Gas Production Committee, and G. L. Bristol, Greenwich

Three photographs of important conference events. (1) A meeting of the Subcommittee on Pipe Coatings and Corrosion. Left to right, seated: J. D. Williams, Jackson; G. Hanshaw, New York; L. K. Richey, Detroit, chairman; and C. F. Turner, Cleveland. Standing: L. W. Tuttle, Oak Park; H. J. Neilson, Saginaw; G. J. Heckendorn, Denver; L. A. Evarts, Long Island; S. P. Cobb, New York, vice-chairman; C. H. Waring, Kansas City; W. E. Kemen, Milwaukee; R. F. Hadley, Philadelphia; C. S. Goldsmith, Brooklyn; D. P. Hartson, Pittsburgh; A. Gordon King, New York, and H. L. Gaidry, New Orleans. (2) Col. Willard F. Rockwell, president, Equitable Meter Co., Pittsburgh, and host at an inspection of his company's plant, greets Frank H. Mueller, of Decatur, Ill. (3) Jeff Collins, New Orleans (standing), presiding at the luncheon conference on Construction and Maintenance. Others in the picture are: E. L. Henderson, Houston; T. H. Kendall, Pittsburgh, and G. J. Heckendorn, Denver.

letter from Dr. Ewing to the conference expressed his continued interest in the A. G. A. corrosion program.

The Wednesday morning session closed with a comprehensive summary of natural gas conditioning equipment and methods by E. C. Kollock, chief engineer, Atlanta Gas Light Co., Atlanta, Ga. Concentrating mainly on odorization, Mr. Kollock presented a complete list and description of all of the general classes of odorizers together with a partial list of dust removers. One section of his paper reviewed some experiments of O. K. Smith of Davenport, Iowa, on a new material that may be considered as a "dust layer," as well as being of value in reducing leakage. A separate section prepared by L. W. Tuttle, Public Service Co. of Northern Illinois, described a new development in humidification.

Shifting the setting of the Distribution Conference to the Mellon Institute for the final session on Wednesday afternoon, gave the delegates a remarkable opportunity to see at first hand this world-famed organization and its facilities. During the 28 years of its existence, it has evolved many novel processes and products, some of which have resulted in the formation of entirely new industries. While it is best known as a technologic and scientific experiment station, it has the innate function of serving as a training school in research methods and in special technical subjects.

Approximately 250 delegates attended the meeting at Mellon Institute under the chairmanship of C. S. Goldsmith, The Brooklyn Union Gas Co., vice-chairman of the Distribution Committee. The business session consisted largely of the reports of the Luncheon Conference Chairmen and reports of the following Distribution Committee sponsors: Portable Tools and Equipment—Charles F. Turner, The East Ohio Gas Co., Cleveland; Regulation and Pressure Control—G. J. Heckendorn, Public Service Co. of Colorado, Denver; Unaccounted-for Gas—W. E. Kemen, Milwaukee Gas Light Co.; Deposits in Mains and Services—A. H. Abbott, Northern States Power Co., Minneapolis, Minn.

In the unavoidable absence of Dr. Edward R. Weidlein, director of the Institute, Dr. L. W. Bass, assistant director, addressed the distribution men on the aims, organization and work of this scientific organization, which has served more than 4000 American companies on problems ranging from food and sleep to glass and steel. Following this, groups of the delegates were conducted through the Institute by Fellows and staff members.

The trip through the Mellon Institute was a fitting climax to one of the most fruitful and enjoyable Distribution Conferences held in many years.

First Motor Vehicles Conference Cites Advance in Modern Transportation Methods

IN a precedent-breaking two-day meeting held simultaneously with the annual Distribution Conference, the first annual conference of the A. G. A. Committee on Operation of Public Utility Motor Vehicles at the William Penn Hotel, Pittsburgh, Pa., April 21-22, centered attention on the growing value of proper transportation methods in modern business. This was the first time that a separate conference has been devoted exclusively to the problems of the motor vehicle operators and gratifying results were achieved.

R. H. Clark, general superintendent of transportation, Consolidated Edison Co. of New York, Inc., chairman of the committee, opened the meeting by introducing Major Alexander Forward, managing director of the American Gas Association, who welcomed the new committee to the Association.

Transportation Progress Traced

The Monday morning session was devoted to two papers on the "Application of Motor Transportation to the Gas Industry." The first, prepared by A. C. Cherry, manager, distribution department, Cincinnati Gas & Electric Co., gave the operating engineer's viewpoint while the second, prepared by J. M. Orr, assistant to the president, Philadelphia Company, covered the transportation supervisor's viewpoint.

Mr. Cherry's paper which was read by Fred Heinlein, supervisor of motor vehicles, Cincinnati Gas & Electric Co., covered the development of gas meter and service trucks from the days of horse-drawn vehicles to the present time. By means of illustrations, the greater convenience and labor-saving improvements of recent years were demonstrated. One most interesting vehicle described was the small coupe equipped with a sliding material tray, used by meter setters and distribution foremen.

There is room for further progress in field of utilization of vehicular equipment in the opinion of Mr. Orr who presented a comprehensive study of the vehicles and operating procedure of the natural gas production department of the Pittsburgh utilities. After paying tribute to the diversified skill of gas company employees, who maintain service in places "where no self-respecting burro would attempt to go," Mr. Orr gave a detailed description of the equipment used, field service and maintenance, and general motor vehicle set-up. Of particular interest was the description of the method used to increase hours of service obtained from tractor trailer units by operating individual tractors with two or more different types of trailers during different periods of the day.

Mr. Orr said that in the metropolitan area periodic inspections and running maintenance are performed in off-peak vehicle hours, principally at night. Each vehicle is inspected monthly with the exception that high mileage vehicles are lubricated and given a short intermediate inspection semi-monthly. All vehicles are subjected to a more elaborate inspection and tune-up semi-annually.

After the morning session, the Motor Vehicles Conference joined with the Distribution Conference in a joint luncheon to discuss mutual problems of national defense. Addresses by Major T. J. Strickler, president, American Gas Association, and E. P. Durfee, of New York, which featured this meeting, are reported in the accompanying article on the Distribution Conference.

Fuel Economy Measures

Shop methods for improving gasoline economy were described by Errol J. Gay, Ethyl Gasoline Corporation, Detroit, in a valuable paper presented at the afternoon session. Mr. Gay declared that the question of maintaining and improving fuel economy is one of attention to detail and careful inspection. He reviewed briefly the fundamental principles in gaining gasoline economy, touched on the trend of engine design during the past ten years, stressed the importance of reasonably good fuels, and went into detail on a number of simple shop methods for checking carburetor settings. He emphasized the importance of making all tests as simple as possible and stated that any steps taken along this line should be part of a normal maintenance program rather than a highly specialized test setup.

Trends in Body Design

A stimulating discussion of the development of body design for various types of public utility motor vehicles occupied the entire session, Tuesday morning, April 22. N. P. Larsen, sales manager, Truck Engineering Corporation, Cleveland, presented an illustrated talk reviewing the progress in this field from 30 years ago to date. The earlier body types were of all wood construction followed by a combination wood and metal, and finally the present-day all metal construction.

The trend in body design Mr. Larsen declared, "is toward use of smaller and lighter weight units where possible from the standpoint of economy. Bodies and the chassis should be considered as tools rather than cargo vehicles or storerooms

(Continued on page 199)

Production and Chemical Men To Review National Problems at Annual Conference

WITH the gas industry marshalling its resources to give utmost aid to the national defense program, the forthcoming annual joint Production and Chemical Conference sponsored by the Technical Section of the American Gas Association is expected to attract the largest attendance of any similar meeting in recent years. The three-day conference, May 19-21, at the Hotel Pennsylvania in New York City will cover practical operating problems and technical research projects as well as many extraordinary topics related to the national emergency.

Unusual significance is attached to a National Defense Forum, at which time all phases of this subject will be reviewed. It is expected that the experiences of those countries now at war will be discussed in the light of American gas practice, and a workable uniform program projected for this country. In addition, subjects related to any possible shortage of raw materials, peak load demands, and by-product manufacture will be aired.

L. E. Knowlton *E. L. Sweeney*
Conference Co-chairmen

Acting as co-chairmen of the meetings, L. E. Knowlton, Providence Gas Co., chairman of the Gas Production Committee, and E. L. Sweeney, Boston Consolidated Gas Co., chairman of the Chemical Committee, will figure prominently in the conference. Their respective committees are sponsoring the outstanding authorities who will appear on the program.

Of particular interest is the group of three round-table luncheon conferences at which specialized discussions of individual problems will take place. These are divided as follows: (1) Coal Carbonization and By-Products—W. T. Brown, Jones & Laughlin Steel Corp., chairman; (2) Water Gas Operation—Samuel Green, The Brooklyn Union Gas Co., chairman; (3) Chemistry in the Gas Industry—Dr. C. W. Wilson, Consolidated Gas Electric Light & Power Co. of Baltimore, Chairman.

Since rapid expansion of industrial activities to meet the demands of national defense will require thousands of engineers and scientifically trained men, the subject of "Cooperative Training of Technical Men" to be presented by Prof. W. E. Nightingale, Northeastern University, Boston, is of unusual importance. This paper will describe a cooperative plan of education and emphasize its immediate and potential value to the gas industry.

Another valuable paper for the operating

Samuel Green

R. J. Sheridan

Alexander Forward

Prof. Nightingale

W. L. Glowacki

J. F. Anthes

R. E. Hall

R. A. Sherman

A. W. Gauger

George R. Steere

Channing Wilson

Linn Bowman

G. T. Bentley

J. D. Doherty

Martin A. Mayers

Donald J. Reese

man is the result of a study by Walter Fuchs, A. W. Gauger, A. G. Sandhoff, and J. A. Taylor, of Pennsylvania State College entitled "Investigations Concerning the Pressures Developed During the Carbonization of Coal." R. A. Sherman of the Battelle Memorial Institute, Columbus, Ohio, will speak on another noteworthy subject, "The Economic Position of the Manufactured Gas Industry."

In addition to the many individual papers to be presented by nationally-recognized experts, a number of committee reports will be made at the conference.

Following is the program in detail:

MONDAY, MAY 19

10:00 A.M.

Opening Remarks—L. E. Knowlton, Chairman, Gas Production Committee, Providence, R. I.

Greetings—Major Alexander Forward, Managing Director, American Gas Association.

Address—National Defense—W. Cullen Morris.

Progress Report on Liquefaction of Natural Gas—J. A. Clark, Hope Natural Gas Co., Clarksburg, W. Va.

Cooperative Training of Technical Men—Prof. W. E. Nightingale, Northeastern University, Boston, Mass.

2:00 P.M.

Opening Remarks—E. L. Sweeney, Chairman, Chemical Committee, Everett, Mass.

Determination and Examination of Light Oil in Gas—William L. Glowacki, Mellon Institute, Pittsburgh, Pa.

Changes in Composition of Manufactured Gas in Contact with Soil—J. F. Anthes, The Brooklyn Union Gas Co., Brooklyn, N. Y.

How Recent Developments of Water Conditioning Technique Are Combating Industrial Water Problems—R. E. Hall, Director, Hall Laboratories, Inc., Pittsburgh, Pa.

TUESDAY, MAY 20

10:00 A.M.

Economic Position of the Manufactured Gas Industry—R. A. Sherman, Battelle Memorial Institute, Columbus, Ohio.

Investigations Concerning the Pressures Developed During the Carbonization of Coal—Drs. Walter Fuchs, A. W. Gauger, A. G. Sandhoff, and J. A. Taylor, The Pennsylvania State College, State College, Pa.

Two Years Experience with Reverse Flow Machines at Portland, Maine—G. R. Steere, Portland Gas Light Co., Portland, Me.

12:30 P.M.

ROUND TABLE LUNCHEON CONFERENCES

No. 1 Coal Carbonization and By-Products—W. T. Brown, Chairman, Jones & Laughlin Steel Corp., Pittsburgh, Pa.

No. 2 Water Gas Operation—S. Green, Chairman, The Brooklyn Union Gas Co., Brooklyn, N. Y.

No. 3 Chemistry in the Gas Industry—Dr. C. W. Wilson, Chairman, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.

A frank discussion of subjects pertaining to the above divisions will be had at these Luncheon Conferences. No stenographic record of the discussions will be kept.

Important: Secure your Luncheon Conference tickets when you register. No tickets can be sold later than 11:00 A.M. Tuesday morning.

WEDNESDAY, MAY 21

10:00 A.M.

The Use of Ammonia in a Thylox Liquid Purification System—Linn B. Bowman, Rochester Gas & Electric Corp., Rochester, N. Y.

Maintaining Gas Manufacturing Plants for Peak Load and Emergency Use in a City Using Natural Gas—G. T. Bentley, Michigan Consolidated Gas Co., Detroit, Mich.

Coal for By-Product Coking—J. D. Doherty, The Koppers Coal Co., Pittsburgh, Pa.

2:00 P.M.

Combustion Characteristics of Coke—M. A. Mayers, Carnegie Institute of Technology, Pittsburgh, Pa.

Developments in Foundry Coke and Foundry Coke Practice—D. J. Reese, International Nickel Corp., New York, N. Y.

Standard Equipment Helps Maintain Gas Service After Landslide

LANDSLIDES resulting from heavy rains caused serious breaks early in March in the two large pipelines through which the Pacific Gas & Electric Company delivers natural gas from Kettleman Hills to Northern and Central California. Nevertheless all the regular customers had ample fuel for their needs and very few of them even knew about the trouble. The simple explanation is that the company operated several gas manufacturing plants it maintains for such emergencies and also made special use of gas from other sources.

The trouble began on March 1 on the Coast Line, which extends from Kettleman Hills to San Francisco and Oakland via Pacheco Pass, Hollister and San Jose. At Los Muertos Creek, 15 miles south of Hollister, a slide tore out about 200 feet of 20-inch main. Twenty-five men were rushed to the scene and, pending the arrival of large pipe for permanent repairs, laid 600 feet of 6-inch main around the gap and transmission of gas was resumed on March 4.

Putting in the temporary line was a mighty tough job, because the break was a mile and a half from the highway and to reach it the men had to cross the creek, which then was a raging torrent, and a mile of plowed land that was thoroughly saturated and exceedingly soft—so soft that a caterpillar sank almost out of sight.

On March 3 a slide between Martinez and Crockett caused a break in the 20-inch section of the Valley Line, which runs through the San Joaquin Valley and into Oakland via Pittsburg and Richmond. That break was speedily repaired, but a larger one occurred the next day and the company had to lay 740 feet of 12-inch main around it. Permanent repairs were completed on March 8.

During these emergencies the company manufactured gas at its plants in San Francisco, Oakland, San Rafael and Stockton. To augment the Bay region's supply, it brought natural gas into Oakland from the Rio Vista field via Napa Junction, Vallejo and a pipeline that crosses the Carquinez Bridge. Also it suspended service to all users of surplus gas—gas sold at exceptionally low rates under contracts providing that it can be shut off whenever necessary to assure an adequate supply to regular customers.

Million Oil and Gas Wells Completed

UNHERALDED and unsung, the last stand of drill pipe came out of a hole in the ground somewhere in the United States toward the end of 1940 to mark another milestone in the 80-year history of the American natural gas and petroleum industries. The 1,000,000th U. S. well drilled in the search for gas and oil had been completed.

Whereabouts of this event, or whether it was a good producing oil well, a gas well, or a dry hole, no one knows. It might have been a commonplace completion of another well in the development of an oil field. It might have been a spectacular wildcat well that found a brand new oil field more than two miles below the earth's surface. Or it might have been just another "duster," a $25,000 or $150,000 failure, a hole in the ground that found nothing but dust.

By the end of 1940 American oil men had drilled 1,008,420 holes in the ground looking for oil. Three-fourths of these, 757,101, penetrated oil sands, and more than half of the successful oil wells, or about 390,000, still are producing. Gas alone, but no oil, was found by 52,848 wells. And 223,359 were dry holes, representing an investment which probably exceeded $5,500,000,000.

Large Gas By-Product Plant to be Built

IMMEDIATE construction of a $1,500,000 addition to the Portland Gas & Coke Company's by-product and chemical plant near Linnton, Oregon, was authorized April 2 by the company's board of directors. It will occupy a recently filled site adjoining the company's plant.

Outcome of seven years of advanced research by gas company chemists and engineers, the new plant will add 6,000,000 cubic feet a day to the company's gas-making capacity. The present daily capacity is 29,000,000 cubic feet. It will also yield products basic to many phases of modern industrial chemistry.

The gas company's plant is said to be the only one of its type west of St. Louis and the first in its particular field. It is expected to be in operation before the end of the year.

Paul B. McKee is president of the Portland company.

Survey Shows Gas Causes Few Fires

GAS and gas appliances, as causes of fires in the United States, are far down on the list of those means by which over 300 million dollars of property is destroyed annually.

In a recent report the National Fire Protection Association, basing its figures on data secured from fire marshals of 15 states, and extending its findings to cover the entire country, pointed out that smoking ranks first, causing a 12.7% loss, whereas gas and gas appliances cause only 0.6% of the 685,000 fires occurring each year.

Nearly half of all fires take place in ordinary house dwellings and cause about 27% of the total loss. Other causes and their percentages suggest that sparks on the roof result in 11.6% loss; unknown causes are third destroying 11.5%; electrical origins are fourth with 9.5%; and defective and overheated chimneys and flues place fifth with 8.5%.

War Forces Changes

From The Gas Times, London

THIS war has taught the gas industry a good many things that might well have been learned in advance. Storage in large, holders at the works or nearby will surely go by the board, as it might well have gone long ago for reasons not connected with war. Mains—well, the tree system, always defective from the pressure equalization point of view, has had the vulnerability of its trunk exposed in no uncertain manner.

So one might prophesy that we shall have just sufficient storage at the works to serve as a reservoir for the compressors to pull against, high pressure containers dotted about the district, a distribution system more in the nature of a network with alternative routes, and those other refinements in detail such as adequate drainage and so on, which bombs have thrust to the fore. Flexible appliance connections have shown their value—and there will have to be a host of changes in every direction if gas is to fit in with that scheme for making a better Britain.

On the production side one may wonder what changes of policy will be needed. Smaller units and the ability to go on making gas, warning or no warning, seem to be obvious developments. For, although we talk once again about a war to end wars, the menace will, unfortunately, still be there and will grow, so we cannot sit back at the end of this war, as we did at the end of the last, and let things rip—until the next starts.

Gasoline and Oil from Coal Reserves

EXPERIMENTS in applying the hydrogenation process to American coals indicate that this country can develop enormous amounts of gasoline and oil from its coal reserves, the Bureau of Mines recently reported to Harold L. Ickes.

The Bureau's process, if applied to the total coal reserves of the United States, could yield enough oil to supply the nation's needs for almost 3,000 years at the present rate of consumption. Coal reserves are estimated at some three trillion tons—enough to yield three trillion, 800 billion barrels of oil.

A description of the method employed by the Bureau of Mines in hydrogenating American coals and results of its early studies are contained in a publication just issued by the Bureau. This publication, entitled Technical Paper 622, Hydrogenation and Liquefaction of Coal Part I, by H. H. Storch, L. L. Hirst, C. H. Fisher and G. C. Sprunk, is obtainable for 20 cents from the Superintendent of Documents, Washington, D. C.

Motor Vehicle Conference

(Continued from page 196)

on wheels, as they have been and still are in many cases."

He recommended a reduction in the number of types to a minimum, asserting that "to get standardization in meter setter and service bodies, it is necessary that a job analysis be made and the definite requirements for each class of service analysed with a view to using any one of several standard body types with accessory equipment." He concluded with "simplification in design, neat appearance for its advertising value, along with general acceptance by utilities will produce the necessary volume for the body manufacturer to bring about attractive costs."

Lively discussion followed Mr. Larsen's paper, ranging from ladder-carrying positions to the all steel body construction versus the composite construction employing ply-metal panels. The use of power take-off compressors, application of special body design to heavy gas service trucks, with some discussion of electric line construction bodies, were subjects aired at the meeting.

The final session of the motor vehicle conference was a closed meeting for public utility fleet operators under the chairmanship of Jean Y. Ray, Virginia Electric & Power Co., Richmond, Va. Specialized problems of fleet operators were discussed "off the record" at this meeting.

Gas Range Shares Attention in Film

A gas range plays a prominent role in the Universal picture, "Nice Girl," starring Deanna Durbin and Franchot Tone. The above scene shows a situation involving (left to right) Ann Gillis, Anne Gwynne, Helen Broderick, Walter Brennan, Robert Benchley and Deanna Durbin

Book Review

Applied Heat Transmission by Herman J. Stover. McGraw-Hill Book Company. $2.50.

Most recent in the series of books on the science of transmitting heat is an excellent short volume entitled "Applied Heat Transmission" by Herman J. Stover, Associate Professor of Mechanical Engineering at Iowa State College.

This book starts off on the right foot by presenting all data in English system coefficients and by arranging the book simply and logically for the use of practicing engineers. The theoretical considerations are left to one side, and the entire presentation is designed to facilitate practical application in the problems of heat transmission.

The author acknowledges his indebtedness to various publications, notably the predecessor "Heat Transmission" by McAdams, to which this book bears close resemblance. McAdams' book is larger and covers more ground, which has both its advantages and disadvantages for the average engineer. Certainly most of the problems commonly encountered are adequately covered by the latest book.

The last chapters of "Applied Heat Transmission" are devoted to consideration of the commercial products available for insulation and how they can be most effectively applied. The preface of the book indicates that the equations of heat transfer by conduction, radiation, and convection are presented strictly from the user's viewpoint, omitting the derivation until after practical methods of applied equations have been demonstrated by the solution of numerical problems. The charts and tables in Chapters IV and V are based upon the equation given by McAdams in the predecessor book on heat transmission, and these charts have been arranged to facilitate their use in connection with design problems.

Professor Stover is to be congratulated on this practical presentation of a complex subject. This is the kind of a book which every heat engineer will want to have on his shelf as a quick and handy reference to heat transmission problems. If he already possesses a copy of McAdams' heat transmission book or is familiar with it, then this new book is of help in bringing him up to date and simplifying the arrangement because much has changed since 1933 in this active branch of science. The modest price of the book, $2.50, should bring a flood of orders to the publishers, McGraw-Hill Book Company.—C. G. S.

Webster Elected Chairman

EDWIN S. WEBSTER, co-founder of Stone & Webster, Inc., has been elected chairman to succeed the late Charles A. Stone. The office of vice-chairman, formerly held by Mr. Webster, has been eliminated.

New Gas Appliance Standards Available

AT the forty-seventh meeting of the American Gas Association Approval Requirements Committee held on March 21, recommended revisions to American Standard Approval Requirements for Gas Water Heaters and Listing Requirements for Attachable Water Heating Units were reviewed and approved with minor revisions. A tentative set of standards covering gas counter appliances was also considered and likewise approved. All become effective January 1, 1942. They are also being submitted to the American Standards Association for acceptance as American Standard.

Strengthening of performance tests for automatic pilots forms one of the principal revisions to current requirements for gas water heaters and attachable water heating units. Tests have been added to assure satisfactory continued performance of such devices for the life of the complete unit. Provision has also been made for assuring rated hydrostatic test pressures for storage vessels of assembled water heaters.

New standards covering gas counter appliances were developed as a result of considerable study and investigation of contemporary equipment. They apply to gas coffee brewers and urns, food and dish warmers, gas waffle bakers, gas-fired hot water immersion sterilizers, and commercial hot plates and griddles. They cover not only city gases, but liquefied petroleum gases and butane-air gas as well.

Although these three sets of requirements do not become effective until January 1, 1942, any manufacturers electing to do so may submit their equipment for test for compliance with them in advance of that date. In that case, Certificates of Approval or Listing granted thereon will be dated as of January 1, 1942, rather than of the time of test, as is customary. Further information may be obtained by addressing the American Gas Association Testing Laboratories in Cleveland, Ohio, or Los Angeles, California.

Personnel Service

SERVICES OFFERED

Fourteen years' experience as manager of manufactured gas properties desires position as **manager** or **superintendent** in gas utility field. Wide experience in sales promotion and public relations work. Thoroughly familiar with all phases of coal and water gas operation. Available now. **1408.**

Experienced **Salesman,** 35, engineering education, proven sales record, executive ability. Experienced supervising sales, service and installation of househeating hotel and restaurant, commercial and industrial uses of gas. At present employed in natural gas city of 65,000. Interested in sales position with gas company or equipment manufacturer. **1409.**

Distribution Superintendent or **Engineer** (36) extensive experience with leading natural and manufactured gas properties on construction, operation and educational activities; B. S. and M. S. degrees in engineering; excellent references; employed but desire change with more possibilities. **1410.**

Customer Accounting Specialist—twenty years' experience in the utility field—on operating properties and in service organizations. Five years' specialized experience on billing installations, meter reading re-routing, service application routine and collection procedure. Available for either permanent position or special assignments. **1411.**

Service man, (32) now employed by large utility corporation in the house heating and water heating gas appliance division, desires position with manufacturer as field contact man or in line with type of work. Also have knowledge of electrical thermostatic controls and all types of house heating systems. **1412.**

Plant Superintendent: Twenty-seven years of thorough experience in gas plant operation. For the past thirteen years in complete charge of operation and maintenance of medium size water gas plant. Family man. Weight 160. Age 44. Best of references. **1415.**

Man exceptionally qualified to head **industrial** department of large utility, to serve a **combustion engineering** concern, or large consumer. Experienced in market surveys, sales promotion, consulting with consumers on utilization. Authority on relative merits of fuels. Writes clearly, in non-technical style. Resourceful—friendly. Registered professional engineer, N. Y. and Pa. **1416.**

SERVICES OFFERED

Gas Engineer, twelve years' experience in **gas utilization.** Activities at present mostly on residential usage but experience includes commercial and industrial utilization. Cooperative and active on gas association committee work, including sales, service technical and appliance servicing. Past accomplishments made on promotion of gas utilization and reduction of service costs. **1417.**

Rate Engineer, for past twelve years staff engineer with engineering consultants prominent in public utility field. Thoroughly experienced in rate research including rate design and application, rate case data, commission negotiations, valuations, original cost, property records, cost analyses, economic and financial studies, investigations, management problems. College graduate, 36, married. **1418.**

Wanted: **Sales** or **production** work in a chemical concern. B.S. in Chemistry, "cum laude," Phi Beta Kappa. Experience in teaching and dealing with people of all ages. **1419.**

Technical graduate (38) registered professional engineer, desires position with utility as **industrial gas engineer,** or with manufacturer as heating and air conditioning engineer. Background includes supervision, contracting, purchasing equipment, sales, design and maintenance. 17 years' experience includes 11 in gas industry. **1420.**

POSITIONS OPEN

Wanted: **Factory representative** for internationally known gas appliance, preferably one who calls on utilities, architects, builders, etc. Choice territories available. **0362.**

Opening for an **experienced meter prover** man between the ages of twenty-five and forty for steady employment at Miami Beach, Florida, meter shop. State experience, names and addresses of past employers and salary expected. **0363.**

Wanted: Good **appliance** salesman to sell gas ranges, storage water heaters and gas refrigerators. State age, experience, references and other details. **0364.**

1941 Advisory Council

F. M. BANKS.....Los Angeles, Calif.
C. W. BENNETT.....Detroit, Mich.
HALE A. CLARK.....Detroit, Mich.
H. E. CLIFF.....Newark, N. J.
H. C. COOPER.....Pittsburgh, Pa.
HUGH CUTHRELL.....Brooklyn, N. Y.
MERRILL N. DAVIS.....Bradford, Pa.
DAVIS M. DEBARD.....New York, N. Y.
H. A. EHRMANN.....New York, N. Y.
H. L. FARRAR.....San Francisco, Calif.
F. B. FLAHIVE.....New York, N. Y.
O. H. FOGG.....New York, N. Y.
F. M. GOODWIN.....Boston, Mass.
ROBERT W. HENDEE...Colorado Springs, Colo.
C. W. HUNTER.....Philadelphia, Pa.
R. L. MANIER.....Syracuse, N. Y.
N. C. MCGOWEN.....Shreveport, La.
D. H. MITCHELL.....Hammond, Ind.
B. J. MULLANEY.....Fitzwilliam, N. H.
F. A. NEWTON.....New York, N. Y.
HENRY OBERMEYER.....New York, N. Y.
JAMES F. POLLARD.....Seattle, Wash.
J. V. POSTLES.....Philadelphia, Pa.
FRANKLIN T. RAINEY.....Columbus, Ohio
W. T. RASCH.....Kansas City, Mo.
W. FRANK ROBERTS.....Baltimore, Md.
J. F. ROONEY.....New York, N. Y.
ELMER F. SCHMIDT.....Dallas, Texas
OTTO SNYDER.....Albany, N. Y.
W. E. STEINWEDELL.....Cleveland, Ohio
JOHN K. SWANSON.....Saskatoon, Canada
FRANK H. TREMBLY, JR.....Philadelphia, Pa.
GEORGE E. WELKER.....Oil City, Pa.
T. R. WEYMOUTH.....New York, N. Y.

AFFILIATED ASSOCIATIONS

Association of Gas Appliance and Equipment Manufacturers
Pres.—W. E. Derwent, Geo. D. Roper Corp., Rockford, Ill.
Exec. Sec.—C. W. Berghorn, 60 East 42nd St., New York, N. Y.

Canadian Gas Association
Pres.—J. B. McNary, Canadian Meter Co., Ltd., Hamilton, Ont.
Sec.-Tr.—G. W. Allen, 7 Astley Ave., Toronto.

Empire State Gas and Electric Association
Pres.—Irving K. Peck, Binghamton Gas Works, Binghamton, N. Y.
Chairman, Gas Section—E. W. Vick, New York State Electric & Gas Corp., Geneva, N. Y.
Sec.—George H. Smith, Grand Central Terminal, New York, N. Y.

Gas Meters Association of Florida-Georgia
Pres.—C. D. Littlefield, Peoples Gas Co., Miami Beach, Fla.
Sec.—H. Stuart Johnson, Florida Public Service Co., Orlando, Fla.

Illinois Public Utilities Association
Pres.—E. F. Kelly, Central Illinois Public Service Co., Springfield, Ill.
Sec.—Jack Abbey, Room 608, Illinois Building, Springfield, Ill.

Indiana Gas Association
Pres.—E. C. Weston, Indiana Gas Utilities, Richmond, Ind.
Sec.-Tr.—H. Wayne Thornburg, Central Indiana Gas Co., Anderson, Ind.

Michigan Gas Association
Pres.—Fred P. Cope, Consumers Power Co., Saginaw, Mich.
Sec.-Tr.—A. G. Schroeder, Michigan Consolidated Gas Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—J. A. Stoll, Baltimore Transit Co., Baltimore, Md.
Sec.—W. D. Haley, 16 Carroll Ave., Takoma Park, Md.

Mid-Southeastern Gas Association
Pres.—J. R. A. Hobson, Director of Public Utilities, Richmond, Va.
Sec.-Treas.—Edward W. Ruggles, Mid-Southeastern Gas Association, Raleigh, N. C.

Mid-West Gas Association
Pres.—C. B. Dushane, Jr., American Meter Co., Chicago, Ill.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—B. C. Adams, The Gas Service Co., Kansas City, Mo.
Sec.-Tr.—N. R. Beagle, Missouri Power & Light Co., Jefferson City, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association
Pres.—Charles G. Young, Springfield Gas Light Co., Sprignfield, Mass.
Exec. Sec.—Clark Belden, 41 Mt. Vernon St., Boston, Mass.

New Jersey Gas Association
Pres.—Frank H. Darlington, Peoples Gas Co., Glassboro, N. J.
Sec.-Tr.—H. A. Sutton, Public Service Electric and Gas Co., Newark, N. J.

Ohio Gas and Oil Men's Association
Pres.—T. C. Jones, The Delaware Gas Co., Delaware, Ohio.
Sec.-Tr.—Frank B. Maullar, 811 First National Bank Bldg., Columbus, Ohio.

Oklahoma Utilities Association
Pres.—R. K. Lane, Public Service Company of Oklahoma, Tulsa, Okla.
Sec.—Kate A. Niblack, 625 Biltmore Hotel, Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—Robert A. Hornby, Pacific Lighting Corp., San Francisco, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—M. A. Boylan, Scranton-Spring Brook Water Service Co., Scranton, Pa.
Sec.—William Naile, Lebanon Valley Gas Co., Lebanon, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—W. H. Haupt, Acme Drilling Co., Coudersport, Pa.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

Southern Gas Association
Pres.—H. Carl Wolf, Atlanta Gas Light Co., Atlanta, Ga.
Sec.-Tr.—L. L. Baxter, Arkansas Western Gas Co., Fayetteville, Ark.

Wisconsin Utilities Association
Pres.—A. P. Gale, Wisconsin Power & Light Co., Madison, Wis.
Exec. Sec.—A. F. Herwig, 135 West Wells St., Milwaukee, Wis.

AMERICAN GAS ASSOCIATION

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK, N. Y.

OFFICERS AND DIRECTORS

President	T. J. STRICKLER	Kansas City, Mo.
Vice-President	GEORGE S. HAWLEY	Bridgeport, Conn.
Treasurer	ERNEST R. ACKER	Poughkeepsie, N. Y.
Assistant Treasurer	JOSEPH L. LLEWELLYN	Brooklyn, N. Y.
Managing Director	ALEXANDER FORWARD	New York, N. Y.
Secretary	KURWIN R. BOYES	New York, N. Y.
Director, Publicity-Advg.	C. W. PERSON	New York, N. Y.
Director, Home Appl. Pl. Bur.	J. W. WEST, Jr.	New York, N. Y.
Sectional Vice-Pres.	E. N. KELLER	Philadelphia, Pa.
Sectional Vice-Pres.	R. J. RUTHERFORD	Worcester, Mass.
Sectional Vice-Pres.	H. CARL WOLF	Atlanta, Ga.
Sectional Vice-Pres.	HARRY D. HANCOCK	New York, N. Y.
Sectional Vice-Pres.	D. P. HARTSON	Pittsburgh, Pa.

FRANK H. ADAMS	Toledo, Ohio	D. W. HARRIS	Shreveport, La.
JOHN W. BATTEN	Detroit, Mich.	CONRAD N. LAUER	Philadelphia, Pa.
WALTER C. BECKJORD	New York, N. Y.	H. N. MALLON	Bradford, Pa.
JAMES B. BLACK	San Francisco, Calif.	CLIFFORD E. PAIGE	Brooklyn, N. Y.
A. F. BRIDGE	Los Angeles, Calif.	FRANK H. PAYNE	Erie, Pa.
JAMES A. BROWN	New York, N. Y.	BRUNO RAHN	Milwaukee, Wisc.
CHARLES M. COHN	Baltimore, Md.	HERMAN RUSSELL	Rochester, N. Y.
H. L. DICKERSON	New York, N. Y.	LOUIS RUTHENBURG	Evansville, Ind.
C. E. GALLAGHER	Cleveland, Ohio	N. T. SELLMAN	New York, N. Y.
N. HENRY GELLERT	Philadelphia, Pa.	MARCY L. SPERRY	Washington, D. C.
R. H. HARGROVE	Shreveport, La.	P. S. YOUNG	Newark, N. J.

SECTION OFFICERS

ACCOUNTING—Chairman	E. N. KELLER	Philadelphia, Pa.
Vice-Chairman	LYMAN L. DYER	Dallas, Texas
Secretary	O. W. BREWER	New York, N. Y.
RESIDENTIAL—Chairman	R. J. RUTHERFORD	Worcester, Mass.
Vice-Chairman	E. J. BOYER	Minneapolis, Minn.
Secretary	J. W. WEST, Jr.	New York, N. Y.
INDUSTRIAL AND COMMERCIAL GAS—Chairman	H. CARL WOLF	Atlanta, Ga.
Vice-Chairman	GEORGE F. B. OWENS	Brooklyn, N. Y.
Secretary	EUGENE D. MILENER	New York, N. Y.
MANUFACTURERS—Chairman	W. E. DERWENT	Rockford, Ill.
NATURAL GAS—Chairman	HARRY D. HANCOCK	New York, N. Y.
Vice-Chairman	J. FRENCH ROBINSON	Cleveland, Ohio
Secretary	E. H. POE	New York, N. Y.
TECHNICAL—Chairman	D. P. HARTSON	Pittsburgh, Pa.
Vice-Chairman	HAROLD L. GAIDRY	New Orleans, La.
Secretary	A. GORDON KING	New York, N. Y.
PUBLICITY AND ADVERTISING COMMITTEE—Chairman	C. A. TATTERSALL	New York, N. Y.

A. G. A. TESTING LABORATORIES—1032 East 62nd Street, Cleveland, Ohio
1425 Grande Vista Avenue, Los Angeles, Calif.

Chairman, Managing Committee	N. T. SELLMAN	New York, N. Y.
Director	R. M. CONNER	Cleveland, Ohio
Supervisor, Pacific Coast Branch	W. H. VOGAN	Los Angeles, Calif.

WASHINGTON OFFICE:
George W. Bean, Fuel Consultant, Albee Bldg., Washington, D. C.

PRINTED IN U. S. A.